

South Dakota State University  
**Open PRAIRIE: Open Public Research Access Institutional  
Repository and Information Exchange**

---

Agricultural Experiment Station Agricultural  
Economics Pamphlets

SDSU Agricultural Experiment Station

---

4-1-1965

# Managing Change in the Livestock Industry of South Dakota: Papers Presented at the Fourth Annual Agri-Business Day 1965

South Dakota Agricultural Experiment Station

Department of Economics, South Dakota State University

Follow this and additional works at: [http://openprairie.sdstate.edu/agexperimentsta\\_ageconomics](http://openprairie.sdstate.edu/agexperimentsta_ageconomics)

 Part of the [Agricultural Economics Commons](#)

---

## Recommended Citation

South Dakota Agricultural Experiment Station and Department of Economics, South Dakota State University, "Managing Change in the Livestock Industry of South Dakota: Papers Presented at the Fourth Annual Agri-Business Day 1965" (1965). *Agricultural Experiment Station Agricultural Economics Pamphlets*. 136.

[http://openprairie.sdstate.edu/agexperimentsta\\_ageconomics/136](http://openprairie.sdstate.edu/agexperimentsta_ageconomics/136)

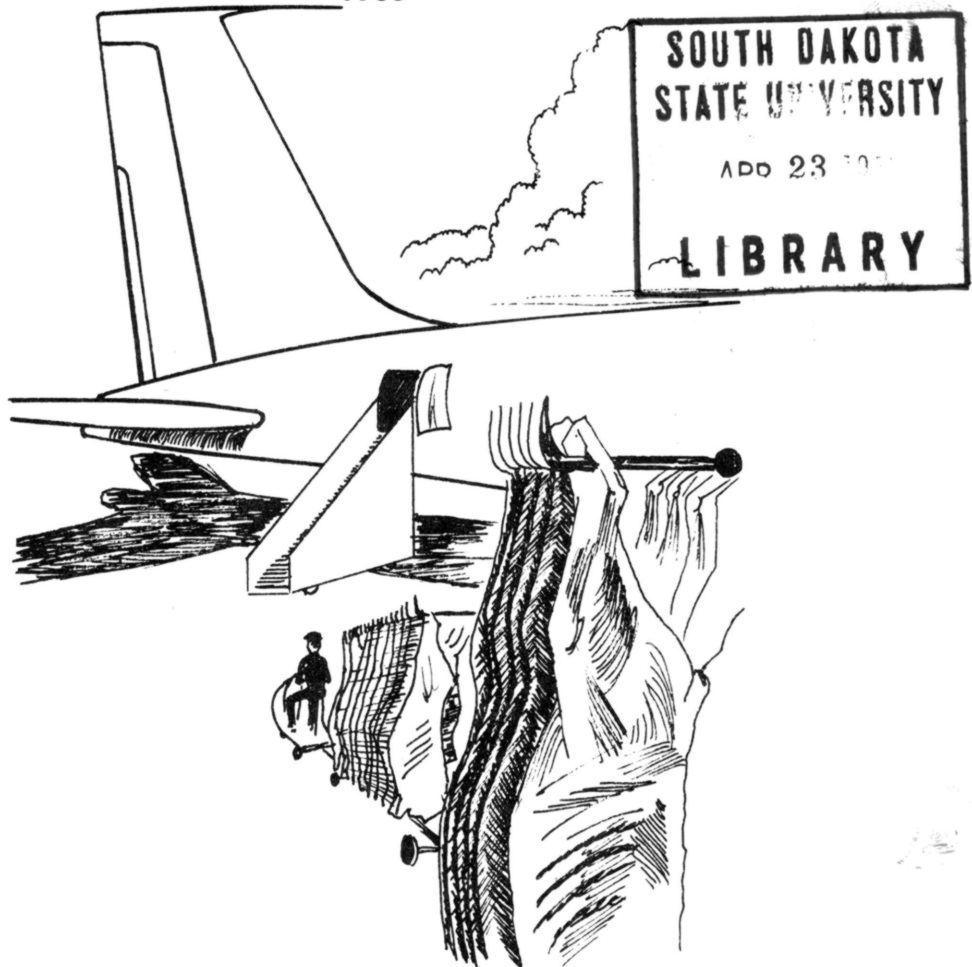
This Pamphlet is brought to you for free and open access by the SDSU Agricultural Experiment Station at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in Agricultural Experiment Station Agricultural Economics Pamphlets by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact [michael.biondo@sdstate.edu](mailto:michael.biondo@sdstate.edu).

# Managing Change in the Livestock Industry

of South Dakota

Papers Presented at the  
FOURTH ANNUAL AGRI-BUSINESS DAY

1965



Economics Department

Agricultural Experiment Station

South Dakota State University, Brookings, South Dakota

Economics Pamphlet 124

630.7  
5087.02  
1965



## Table of Contents

	Page
Introduction ----- Orville G. Bentley	1
Changes Reflected Through Prices ----- Robert L. Beck	4
Market-Channel Power ----- Donald B. Erickson	15
Marketing Changes in Consumer Tastes --- Harold J. Tuma	28
Managing Change in Marketing ----- Wayne J. Schulte	35
Our Changing Competitive Position ----- Rex D. Helfinstine	48
Money Management - Key to Success ----- Kenneth R. Krause	54

Compiled by Robert L. Beck and Donald B. Erickson

## INTRODUCTION

Orville G. Bentley \*

It is appropriate that the annual agri-business day program address itself to the current status and future potential of South Dakota's largest industry, the meat animal business.

The 1965 program is the fourth in a series designed to probe opportunities for increased economic development of human and physical resources in our state. If maximum development is to take place, we must study every resource, discuss it, and then determine how we might harness it to fit man's social, cultural, and economic goals.

South Dakota State University is proud of its long tradition of helping individuals and groups solve problems. But we feel that our first responsibility as educators, both on and off campus, is to kindle ideas and spark imagination. This is a basic resource of leadership. If we can provide South Dakotans with some basic information, stimulate some thinking, and encourage individuals and groups to set up realistic goals or make plans to reach a realistic goal, we have provided a worthwhile service.

The livestock industry is now the major source of cash farm income in South Dakota. We know this figure fluctuates around 70% of the total. We also know that the growing of feed required for meat animal production has an influence on land use patterns and on cropping practices throughout the state.

The staff participants from South Dakota State University have their work cut out for them today. As economists and specialists, they have a number of alternatives for conducting this session. Some analysts deal only with what has already happened, then take a cautious look at some short-term predictions about price and demand trends. Others talk only of long-term predictions, which allow more flexibility on the part of the "predictor". It is easier to talk about things in the distant future than to answer a specific question as the expected September price of fed cattle.

On the other hand, our analysts deserve consideration. They are asked to predict the future on the basis of tangible factors of supply, demand, and alternate investment opportunities. But there is one big tangible factor that shapes economic trends and that is the public itself.

Despite this formidable obstacle, your discussion panelists have addressed themselves to worthwhile questions. I hope they will be willing to make some predictions that will help you make decisions about the future of South Dakota's livestock industry.

---

\* Dean of Agriculture, Director of Agricultural Experiment Station, South Dakota State University.

As you may have guessed, and have probably heard me state repeatedly, I am optimistic about the future of the livestock industry in South Dakota. Perhaps you are familiar with the South Dakota Livestock Expansion Foundation, a group of people interested in the livestock industry which set some goals for it back in 1962. That year we produced about 2.4 million hogs, 1.3 million lambs, 1.4 million calves, 1.4 million pounds of milk, and about a billion eggs. We fed 404,000 cattle and 475,000 lambs.

In setting up goals for South Dakota's livestock industry, this group felt that by 1980 we should double the number of hogs, cattle, and lambs on feed; produce 700,000 more calves; 330,000 more lambs; increase milk production 58% and egg production by 43%.

You might question the validity of their projections, but I feel their optimism and the direction for the industry is most appropriate when you consider national meat consumption trends.

Total red meat consumption is now estimated at 174 pounds per person, up 10.4 pounds already from what it was in 1962. We now eat 100 pounds of beef per person and 64 pounds of pork annually.

The question boils down to this. What groundwork do we do now to prepare for the meat demands of 1980? Obviously, we will have to have more beef cows, more flocks, and more herds. There are, however, additional developmental factors directly or indirectly associated with progress in the livestock industry. In fact, some of the most important ones may seem unrelated to the meat industry itself at this time.

For example, decisions made on water resource development such as the Oahe project will have a tremendous influence over the amount of feed we produce, particularly the stability of our feed supply. A stable feed supply is a limiting factor for South Dakota livestock producers today. It could well be that our feed supply will determine how well South Dakota feeders can supply both large and small meat markets with a product that is high in quality and attractive to the consumer.

Let me remind you that most of the answers we are getting from research in livestock production today are from experiments begun 10 to 20 years ago. If we expect to have answers for problems in animal health, range management, crop production, animal breeding, and nutrition for the stockman of 1980, we must expand these areas now. Certainly the imagination of stockmen today will determine how well the livestock producer of 1980 will be able to meet the needs of his market.

Quality must be the key to the growth of this industry--quality in breeding herds and flocks, quality in feeder stock, and quality in the finished product--a quality trademark that will focus attention on the livestock industry of South

Dakota. We need to strengthen and broaden the good reputation South Dakota already enjoys as a place where buyers can get the quality they want and need, when they want it.

I am also optimistic about our quality factor. We now have high standards for quality in some areas. Where good quality does exist, it can be refined, improved, and expanded to include larger portions of the industry. One of my reasons for being optimistic here, for example, is the response and encouragement the Cooperative Extension Service is getting in setting up carcass evaluation work on both a county and state 4-H level in the coming year.

I feel we have a sound base for livestock expansion. We have good livestock men, good potentials for market outlets, and the ability to produce feed. Coupled with this, we need optimism for the future.

Our population stands at 192 million today, and some predict 250 million by 1980. Assuming that this is a 30% increase in population, plus the fact that red meat consumption per person is going up rapidly, it is easy to see how the demand for red meat will be up from 35 to 50% within 15 years. How much of that increased demand for meat will be met by South Dakota producers?

Obviously, the expanded demand for meat represents an opportunity for people who prepare for it. We would be foolish to leave the destiny of our livestock industry in the hands of Lady Luck.

Let there be no mistake--the leadership and imagination that we take, along with other facets of the meat industry, will determine the future. This leadership will have to be a combination of the best that can be offered by the producer, the processor, the marketing agency, and the consumer.

If we are so shortsighted as to think that we do not have to adjust to changing times in product technology and consumer preference, the livestock industry will build itself into a straight jacket and suffocate from its own rigidity.

Producers, processors, and marketing outlets must stay in tune with new developments that affect all segments of the industry and all points in the food chain. This can be done only by enlightened leadership that seeks to communicate with all facets of the livestock and food industry.

I hope that this fourth agri-business day program will help establish some bench marks that might serve as a basis for better understanding of some of the basic factors involved in the economics of livestock production and in the marketing of these products. If it accomplishes this objective, I am sure that my associates will feel the time has been well spent. But we want to learn more about the industry, its goals and problems; thus, you can help us by your comments, frank evaluation of current projects and, most importantly, by suggestions for future needed educational programs.

## CHANGES REFLECTED THROUGH PRICES

Robert L. Beck \*

Consumption is the sole end and purpose of all production, and the interest of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer.

-Adam Smith

The above principle, set forth in Adam Smith's Wealth of Nations in 1776, was penned at a period in history when the mercantile system was in its infancy. It sounded a warning to producers that survival in that type of system was dependent entirely upon the actions of the consumer. The principle suggests the sovereignty of the consumer. This idea is still espoused by many. In a recent book entitled The Powerful Consumer<sup>1</sup>, the author attempts to give weight to the old saying -- "The Consumer is King."

The theme for this program suggests two things concerning the power of the consumer. First, changes are occurring in the industry, many originating at the consumer level. Second, it suggests the possibility of guiding or managing these changes by producers and processors. The effectiveness with which this latter is accomplished will determine, to a large extent, where the power lies. The consumer may still be king but dominion over the marketing system is not as great as that expressed above. The consumer still makes the final decision but many times this decision is influenced by outside forces.

It is only natural that livestock producers be interested in the forces affecting consumer decisions. More specifically, producers are interested in the factors which cause consumers to choose a particular kind or cut of meat in lieu of all the alternatives. Since the consumer is faced with a multiplicity of wants (ends) competing for scarce resources (means), a decision must be made as to what combination of goods and services will best satisfy these wants. What, then, are the motivating forces underlying consumer behavioral patterns in purchasing meat and meat products? Recent studies provide some insights which should prove helpful.

### Demand Characteristics

Changes in the total demand for red meat are based primarily on: (1) changes in the size and location of population, (2) shifts in disposable income, (3) changes in consumer tastes and preferences, and (4) availability and price of substitute products.

In this country, population has been increasing at a rate of about 1.5 to 2.0% annually. This means a 15 to 20% increase every 10 years. Not only has the

---

\* Assistant Professor of Economics, South Dakota State University.

1 George Katona, The Powerful Consumer, New York: McGraw - Hill, 1960.

increase in population been a major factor contributing to the total market for meat products, but the change in location of population also has a significant effect. The farm population depends on the commercial market for only one-half of the meat it consumes. Thus, the movement of people from rural to urban centers increases the demand for commercially produced and slaughtered meats. This increase results not only from the decline in home production, but from greater consumption of meat due to the higher incomes earned in non-farm occupations.

Last year, consumers spent about 18.5% of their disposable income for food and food services. Expenditures for meat accounted for 25% of this. An increase in income usually results in increased spendings for services and higher quality. With increased incomes consumers shift meat purchases to more beef and lamb and to more expensive cuts such as steaks and roasts.

Part of the increase in consumption of meats during the past several years can be attributed to changes in consumer tastes and preferences. Even though total per capita consumption of food has changed very little in the past 50 years, the composition of the average diet has changed markedly. Potatoes and cereal foods have been replaced by more fruits, vegetables, and animal products. Consumption of animal products increased noticeably during and immediately following World War II. Fortunately for the livestock industry, the consumer's slowly changing food habits have been in the industry's favor.

Finally, the demand for meat and meat products is affected by competition from substitute products. Consumers tend to substitute similar products for one another as price and availability change. Meats are substituted for one another depending upon their relative price and availability. Pork, for example, is substituted for beef when pork is plentiful and prices are relatively low. As the pork supply declines and the price differential narrows, consumers tend to shift back to beef. Poultry, fish, and synthetic products also compete for a share of the consumer's meat dollar in addition to the competition among the red meats. A soybean base meat substitute is currently in the development stage. Once the process is perfected, the product will no doubt have some impact on the demand for red meats.

#### Effect of Price, Income, and Substitutes on Consumption

The consumer market for meats responds to a variety of forces, as outlined above. The response to some of these forces may be predicted with some degree of accuracy; for others, predicting is difficult and often hazardous. For example, past studies have measured the consumer's reaction to changes in price, disposable income, and relative price changes of substitute products. These relationships are explained in terms of the concept of "elasticity of demand." They are referred to as "price elasticity," "income elasticity," and "cross elasticity" of demand.

Price elasticity: Price elasticity is a measure of the consumer's reaction to price changes. It measures the percentage change in the quantity consumed resulting

from a 1% change in the price of the commodity<sup>2</sup>. Other things being equal, a decrease in the price of a commodity results in an increase in its consumption, so price elasticities of demand are invariably negative. If quantity demanded is quite responsive to price changes (i.e. price elasticity is greater than 1), demand for a commodity is said to be "elastic." A decrease in price results in an increase in total expenditures. An elasticity value of 1.5 would indicate that a 10% reduction in price would result in a 15% increase in total consumption.

Conversely, if the quantity demanded is not responsive to price changes (i.e. price elasticity is less than 1), a decrease in price may decrease the total amount of money spent on the commodity. In this case, demand is referred to as "inelastic." Price inelasticity indicates that the change in consumption will be proportionately less than the change in price. An elasticity of 0.7 means that a 10% decrease in price would result in only a 7% increase in consumption. This would result in less total expenditure for the commodity.

Since the demand for most red meats is relatively inelastic, a retail price drop results in less than a proportionate increase in consumption. This results in a reduction of gross income at the retail level because the increase from added sales does not compensate for the loss caused by the price drop. This income reduction at retail level is usually passed down to the producer where its full impact is felt.

Income elasticity: The way in which consumers respond to higher incomes is likewise related to consumption of meat and meat products. A measure of this response, income elasticity, is similar to price elasticity in that it measures the effect of a change in income on expenditures whereas price elasticity is a measure of the effect of a price change on expenditures. Income elasticity is defined as the percentage change in the quantity demanded which would result from a 1% change in money income, other quantities and prices being held constant. For example, the income elasticity of demand for the period 1955-57 was .47 for beef, .32 for pork, and .65 for lamb and mutton<sup>3</sup>. Thus, a 10% increase in

2 The formula used to determine the numerical value of price elasticity is as follows:

$$P_E = \frac{(q_0 - q_1) (P_0 + P_1)}{(q_1 + q_0) (P_0 - P_1)}$$

Where:  $P_E$  = price elasticity  
 $q_0$  = the original quantity consumed  
 $q_1$  = the new quantity consumed  
 $P_0$  = the original price  
 $P_1$  = the new price

3 G. E. Brandow, Interrelations Among Demands for Farm Products and Implications for Control of Market Supply, Agricultural Experiment Station Bulletin 680, The Pennsylvania State University, August 1961, p. 17.



consumer incomes resulted in a 4.7% increase in consumption of beef; 3.2% increase in pork; and 6.5% increase in lamb and mutton.

Cross elasticity: Cross elasticity of demand provides an explanation of what happens to the quantity of a product demanded when the price of a substitute changes. What happens to the quantity of beef demanded when the price of pork declines, or vice versa? Cross elasticity is a measure of the change in quantity of beef demanded which would result from a 1% change in the price of pork. With a cross elasticity of demand for beef of  $.10^4$ , a 10% increase in the retail price of pork results in a 1% increase in the quantity of beef demanded.

The significance of these elasticities of demand becomes apparent when they are translated in terms of the implications for the livestock producer. These are relationships existing at the retail level. But, since the demand for livestock is derived from the demand for meat at the retail level, changes in demand for meat are reflected in the price paid to the producer. Because of relatively fixed marketing charges, the price paid to producers usually reflects a very high proportion of the change at retail level.

#### Trends in Consumption of Red Meats

Just how well has the meat industry fared with the consuming public over the past few years? Changes in per capita meat consumption since 1900 are shown in Figure 1. Total red meat consumption per person set a new record in 1964. Total consumption reached about 174 pounds per person, 4 pounds more than in 1963. The general trend has been upward since 1935 when consumption fell to the lowest point on record, 117 pounds per person.

All meats have not shared equally in this increase. Per capita consumption of pork dropped sharply after the severe drought and the reduction in hog numbers in the mid-1930's, then increased to high levels during World War II and the immediate postwar years. Since 1946, the general trend has been downward. Per capita pork consumption of about 64 pounds in 1964 was down from 65.5 pounds the previous year. A further decrease is projected for this year.

Average consumption of veal and lamb and mutton, which are less important in the total meat picture than beef or pork, increased slightly from the 1930's through World War II, then declined. Last year, consumption of veal was about 5 pounds per person; lamb and mutton, about 4.2 pounds.

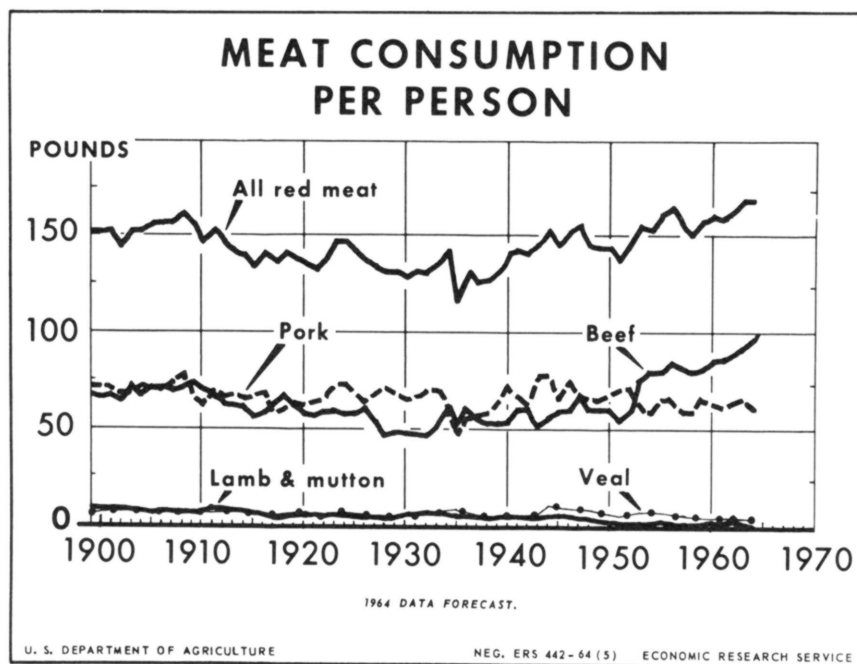
Consumption of beef has increased sharply since the early 1950's. Average per capita consumption of 100 pounds last year represents a 5 pound increase over 1963. Last year was the sixth consecutive year in which beef consumption per person has increased.

---

4 Ibid., p. 17



Figure 1 - Per Capita Red Meat Consumption,  
United States, 1900 - 1964



The trends and changes in patterns of consumption outlined above contain important implications for the producer as well as for those involved in the marketing of meat and meat products. The changing patterns of meat purchases are materially influenced by (1) changes in income, (2) degree of urbanization, and (3) technological changes in production and marketing.

Continued shifts in the kinds of meat purchased are expected with the projected shift of the population up the income scale. This could lead to a further decline in the relative importance of pork unless more emphasis is given to producing more desirable meat-type hogs. Demand for more expensive cuts of meat is likely to increase.

The shift of population from farm to urban centers has increased the demand for commercially produced and slaughtered meat. Part of this increase is the result of higher income which accompanies a shift from farm to nonfarm employment.

Changes in production have affected patterns of meat consumption. Improved quality affects competition among types of meat. Increased emphasis on meat-type hogs tends to strengthen demand for pork. Stronger demand for better cuts and grades of meat leads to a greater price differential between cuts and grades and thus encourages further improvements in livestock.

Technological changes in processing and marketing likewise influence the pattern of meat consumption. Any advance in the technique of making meat less perishable means that cyclical fluctuations in supply may be reduced by changes in stocks. The flow into distribution could then follow more closely the comparatively constant demand for meat. Some methods of preserving meat which may become practical are sterilization by radiation, dehydration, and freeze-drying. In addition to minimizing variations in supply, these methods could cut down on shipping and storage costs and thus lead to lower total market costs.

### Pricing Meat and Livestock

The pricing of meat and livestock and the relationship of prices at all levels from live weight to the final consumer are of vital concern to stockmen. To say that the price of meat -- and therefore of livestock -- is determined by supply and demand is to highly over-simplify the whole matter, even though it is true. Many factors, all of them constantly changing, affect both supply and demand. It is the interaction of all these factors that determines price.

### Pricing Meats at Retail

Each retailer is faced with the problem of finding the "right" price for each cut of meat. To do this, he must anticipate the market for the many cuts of meat from a carcass. His only guide is the average cost of all the cuts. The retail price of the various cuts must be in proper relationship to one another so that all are sold. Otherwise, some cuts may sell quickly, leaving a surplus of others. The retailer must think in terms of the whole carcass and not simply about popular cuts. This the trade refers to as "pricing to obtain balanced carcass movement." The price at which retailers can sell each retail cut reflects the value -- that is, consumers' demand -- placed on that cut by meat customers as a group. That value will not be the same at all times and in all areas. Therefore, the price spread between retail cuts varies between market areas and seasons.

Perhaps, while all would agree that prices are determined by supply and demand and that retail and live weight prices are closely related, questions are often raised as to whether retail prices respond as quickly and as fully as they should to changes in live and wholesale prices. Retail prices do lag in adjusting to declines in livestock prices. Part of the answer to why this happens is the time required to move the product through the market channel.

It takes time for changes in supply, and information regarding these changes, to move from level to level in the marketing system.

Another contributing factor may be retailers' preference for stable "regular" prices. Retailers are reluctant to change prices except for "specials." The tendency is to hold "regular" retail prices steady and adjust to changes in supply by changing the intensity of merchandising or use of "specials." Regular prices are reduced only when it becomes apparent that the supply change is too great to be handled in this way and that competitors are likely to lower their regular prices.

Still another, but less convincing, reason for the lag in adjusting retail prices arises from uncertainty. Retailers are not sure that any given change in costs will persist for a significant period.

The extent to which retail prices adjust to changes in live prices influences production decisions. There is a tendency for live prices to overadjust to changes in supply. When this happens, production and feeding are overstimulated on rising markets and too sharply cut back on falling markets. This would be lessened if retail prices were more sensitive to wholesale and live prices. To the extent that increases in retail price sensitivity would reduce this tendency, producers would be benefited.

### Marketing Margins

The retail price of any cut of meat represents a composite of all costs involved in producing and marketing that cut. Since the producer no longer barter, his products direct to the consumer, this price must be shared among the producer and the various marketing agencies. "Marketing Margin" represents that part of the retail price accruing to the marketing agencies for services performed. Marketing margins include all charges by the marketing agencies for moving live animals from the farm and converting them to meat in the consumer's hands. This includes charges for assembling, processing, transporting, and distributing. That remaining portion of the retail price which the producer receives for the live weight equivalent is referred to as the "farmer's share." This reflects the extent to which the producer shares in each dollar spent by the consumer.

What has happened to the level of marketing margins for meat in recent years and what are the implications for the producer? In other words, how have the producer and the marketing agencies shared returns from the retail sale of meats? Figures 2, 3, and 4 show the marketing margins for beef, pork, and lamb from 1947 through 1963. One thing that soon becomes apparent is the widening trend between farm and retail prices during the period.

The relevant question then becomes one of whether this increase in marketing margins was necessary to cover expenses of the packers and retailer, or has the increase been reflected in higher profits to the marketing agencies? Operating expenses for both packers and retailers increased during the period. The increase in productivity has been at a somewhat lower rate, so that it now costs more to handle a pound of meat than in 1947. Both the packer and retailer pay considerably more for their labor per hour than ever before. Hourly earnings, including fringe benefits, for employees of food marketing firms more than doubled from 1947 to 1963. However, part of this increase has been offset through more efficient operations, less labor and correspondingly more equipment, and gains in outputs per man-hour. Even with these offsetting forces, labor costs per unit of product marketed increased about 50% during the period.

Figure 2 - Retail Price, Farm Value, and Spread for Beef  
(Choice Grade), 1947-1963

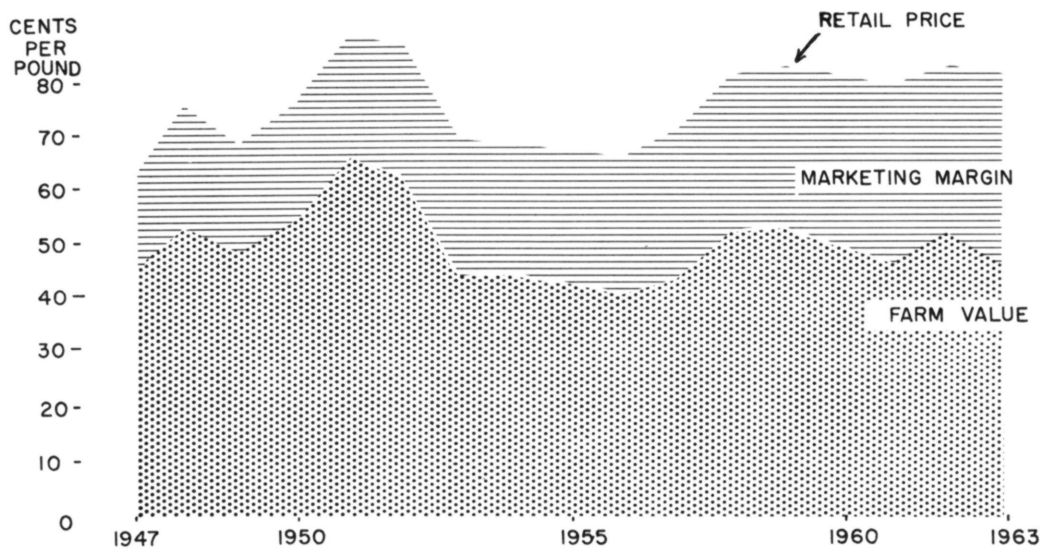


Figure 3 - Retail Price, Farm Value, and Spreads for Pork,  
(Retail Cuts), 1947-1963.

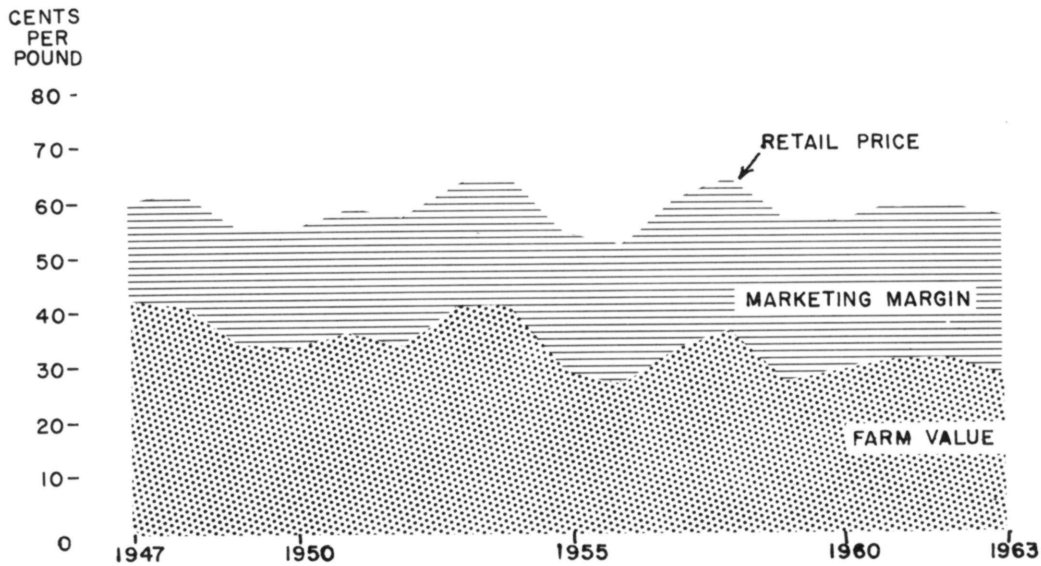
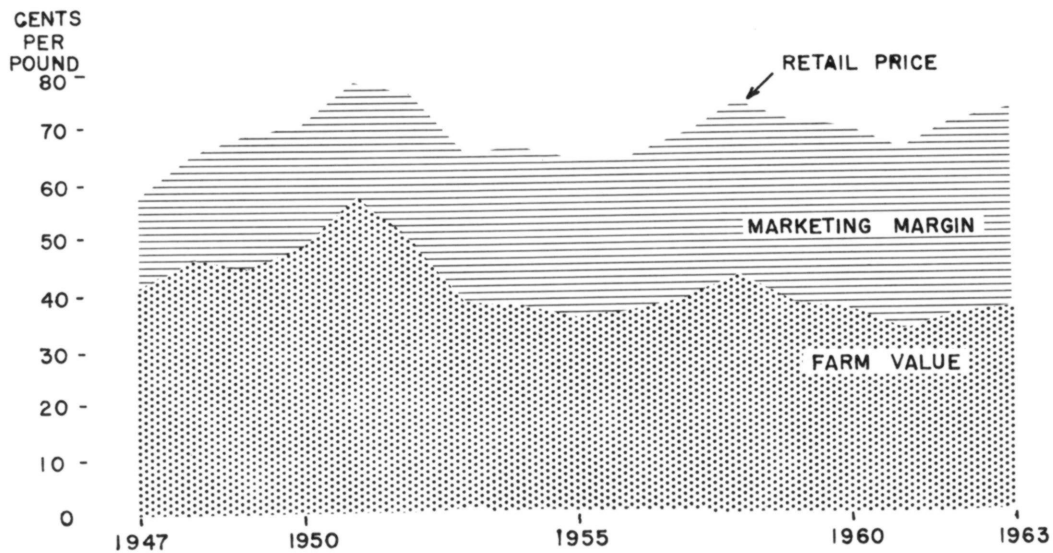


Figure 4 - Retail Price, Farm Value, and Spreads for Lamb  
(Choice Grade), 1947-1963



There has also been a trend toward more prepackaging, closer trimming, and deboning of cuts. Each of these changes represents a change in the quality of the product and a change in cost.

Despite the increases in the marketer's share of the retail price of meat, overall profits per dollar of total sales reported by packers and retailers have not been large in recent years. Profits have fluctuated considerably from year to year, but no significant trend is discernible from data for the past 15 years. However, this relatively steady level of profits does not necessarily mean that the increased marketing margin has been necessary to meet increased costs. It is possible for marketing margins to widen with steady or even declining profits. This depends upon the amount of overhead charged to each item by the retailer. It appears that beef is currently carrying a larger proportion of the retail overhead cost than it was 10 years ago, while pork may be carrying less. Thus, for beef, a portion of what otherwise would be reflected in profits becomes an expense of doing business.

#### Pricing Livestock at Farm Level

Prices of livestock at the farm level are derived from the value of products obtained from them. Changes in the price of meat and by-products are usually reflected in the prices received at the farm level. The number of livestock on the market -- day-to-day, seasonal, and cyclical variations -- exerts an immediate influence on price. Generally, livestock prices are more responsive to changes in both supply and demand than are meat prices. Since prices at the producer level are affected by changes in the supply of meat and meat products, factors affecting supply at the retail level must be considered when discussing the pricing of livestock. One such factor is meat imports.

Foreign Trade in Livestock Products: Imports have figured heavily in placing the blame for declining prices in the livestock industry recently. To indicate that imports do not affect price is incorrect; to ascribe to them full blame for low prices is equally incorrect. The United States is currently a net importer of livestock products. Net imports of red meats increased 79% from 1958 to 1963 -- to almost 2 billion pounds. Most of the increase during this period was attributed to beef.

While the amount of imports is important in determining their effect on price, quality of imported meats should not be overlooked. Domestic production provides most of the high quality meats consumed in the United States. An exception is canned hams and pork shoulders. These are regarded as speciality items and usually sell at higher prices than United States canned hams and shoulders. Lower priced meats used primarily in making hamburger and processed products are imported in substantial quantities. Boneless beef, veal, and mutton are imported for these purposes. In 1963, boneless beef accounted for about two-thirds of total red meat imports. This one item alone has accounted for most of the growth in meat imports since 1958. Trade in the other red meats is on a relatively small scale. Canned hams and shoulders account for almost three-fourths of the total pork imports.

Stockmen have experienced recurring price difficulties in recent years. Because of increasing imports of meat and meat products during this period, it was only natural to point to imports as the primary cause of lower prices. In 1963, the United States Department of Agriculture initiated a study to determine the impact of meat imports on cattle prices<sup>5</sup>. The results appear significant in appraising the influence of imports on price.

Briefly, the study revealed the following relationships between meat imports and cattle prices. First, since fed cattle prices are influenced primarily by fed beef production, a 10% change in steer and heifer beef production was associated with a 13% price change in the opposite direction. A similar change of 10% in domestic cow production<sup>6</sup>, plus imports, was associated with only a 3% change in Choice steer prices, in the opposite direction. Thus, a change in fed beef production has a far greater impact on fed beef prices than a similar change in cow beef production or a comparable change in imports. The significance of this is increased by the fact that fed beef accounts for the principal part of total domestic commercial slaughter.

Second, the effect of imports on cattle prices is influenced by the level of imports relative to domestic production. When imports equal about 10% of total domestic production -- as in 1963 -- an increase of 10% in imports would cause, on the average, a drop of 1% in the price of Choice steers. At levels of 5 and 20% of domestic production, a 10% increase in imports would cause drops of .7% and 1.6%, respectively.

Early last year, the United States Government took steps to reduce, or limit, imports of meats. Agreements to limit shipments were reached with Australia, New Zealand, and Ireland, the three largest suppliers. The agreements vary somewhat, but all cover beef and veal in all forms except canned, cured, and cooked meats and live animals. Mutton is also covered in the agreement with Australia. These agreements provide for moderate reductions in total imports from the 1963 level and also limit future growth in imports considerably below increases of the past few years.

Since the agreements were reached, a bill has been passed to restrict imports of beef, veal, and mutton. Canned and cured beef from Argentina and Uruguay are excluded. The formula for imposing quotas is designed to keep imports at 15% under the 1963 total. The bill becomes effective this year. The agreements, short supply in some countries, and relatively better markets for beef in Europe have all contributed to a decrease in imports in 1964 compared to the 1963 levels.

---

<sup>5</sup> "The Import Situation for Beef and Veal," Livestock and Meat Situation, ERS, USDA, November 1963, pp. 35 - 43.

<sup>6</sup> Since the quality of imported beef is generally comparable to that of domestic cow beef, cow beef production was used to estimate the impact of imports on cattle prices.



Finally, a factor which influences the prices received for livestock at the producer's level, though often overlooked, is the market for by-products. Livestock have value not only because of the meat they produce but also for their many by-products. On the average, by-products make up: cattle, 10 - 20%; sheep and lamb, 20 - 30%; and hogs, 2 - 5% of their total value. Prices received by packers for the various by-products change from day-to-day and are thus reflected in changes in price at the producer level. The United States depends heavily on the foreign market for disposing of hides, fats, and oils. In 1964, the value of our net exports for these items amounted to \$152 million.

The combination of all the above factors which affect the production has to be transmitted back to the producer. Even the improved communication system that has been developed can not combine all these factors so the producers can interpret them. The only mechanism, and thus far the best, which reflects the consumer's demand is through the price system. Each factor has an effect on the price at different stages, but the price the producer receives will reflect most of the demand preferences of all livestock products by the consumers.

## MARKET-CHANNEL POWER

Donald B. Erickson\*

The livestock producer sells his product, whether it is fat steers, lambs, or hogs, to various buyers to be ultimately slaughtered. This is just the first in a series of complicated steps through which the carcasses of the animals move in the marketing process. After slaughter the meat is shipped to various locations to be sold either as fresh meat or further processed.

First, let us define marketing. Marketing involves the entire process which transfers the ownership of products from the producers to the consumers. Livestock marketing includes all of the buying, selling, and processing functions performed from the producer to the point where it is consumed in the form of a steak, roast, or processed meat.

Marketing reminds me somewhat of the old mortar question: "Does mortar hold bricks together or apart?" Similarly, does the marketing system hold the producer and consumer together or apart? There are arguments both ways, depending upon a particular point of view. I prefer to think that it holds the producer and consumer together. The marketing system brings supply and demand together. Consider the total number of heterogeneous producers throughout the United States producing innumerable varieties of meat. Consider also the consumers. Each is an individual, comprising another very heterogeneous group. The marketing system is charged with the responsibility of obtaining the "right" mixture of production from the farm level, processing it, and moving it to the "right" people. This is further complicated by still other factors, such as religions, races, habits, and climatic conditions.

Marketing involves changing the live animals into a form which the consumer is willing to purchase: cut steaks wrapped in cellophane, ready-to-eat cold cuts, etc. The marketing firms also have to provide the right kind of meat continuously to satisfy the consumers' wants. For example, the people in New York prefer steer beef but won't eat very much heifer beef. In Chicago the heifer beef is readily sold. Another example: lamb is produced mainly in the Western and Mountain States but consumption occurs on both coasts, while very little is consumed in the areas of production or the Midwest. These functions are performed daily by America's complex marketing system.

---

\*Assistant Professor of Economics, South Dakota State University



## Market Functions

Generally the functions performed by marketing firms are classified into eight groups. The emphasis on each depends upon the commodity.

1. Buying (includes assembling)
2. Selling
3. Storage
4. Transportation
5. Standardization
6. Financing
7. Risk-bearing
8. Market information

In the marketing of livestock a firm may perform any one or a combination of these functions. The buying function is largely one of seeking out the sources of supply, assembling of products, and the activities which are associated with purchase. This can be done at any level from the producer to the consumer. The selling function must be broadly interpreted. It is more than passively accepting the price offered. It includes merchandising, advertising, proper packaging, selecting the best market channel, timing of the sale, and the physical handling of the commodity. The storage function involves providing meat at the desired time. The transportation function concerns making meat available at the desired place of consumption. This involves a transportation cost which the marketing channel must minimize. The standardization function establishes and maintains uniform grades and weights. The financing function advances money to carry on the various marketing activities. The risk-bearing function accepts the possible loss due to spoilage or death of the animals and price changes between the time of purchase and selling. The market information function collects, interprets, and disseminates the large variety of data, such as prices and signals from the consumer. (3)<sup>1</sup> These functions do not change, but the individuals and firms performing the functions may change as the market structure changes.

## Market Structure

Various firms make up the market structure in the livestock industry: country buyers, auction markets, meat packing plants, breaking plants, wholesalers, retailers, to name a few. The market structure changes as a result of changes in transportation, communication, and technical innovations adopted by marketing firms.

The major concern of each marketing organization is one of survival. No one likes to go broke. It is a well known fact that a firm can't just "stand still." It either grows or dies. Thus, the one goal of any firm

---

<sup>1</sup> The numbers enclosed in parentheses correspond to the number of reference at the end of this article.

becomes one of growth which enhances survival. As we look back to the early and mid-nineteenth century, we see that the wholesalers were the first real power of the livestock marketing industry, owing mainly to the transportation system in existence at that time. These wholesalers, who were located in central locations, purchased the commodities from nearby farms and ranches. The small packers or butchers sold their products to the wholesaler, who in turn redistributed them to the small neighborhood grocer. The wholesalers grew until they were virtually in charge of the marketing system.

The invention of commercial refrigeration enabled the packers to build large plants in central locations such as Chicago and St. Louis, cities located along the railroads. The railroads were used to bring the large quantities of live animals from great distances in the West. With the increased volume being handled by each packer, the retailers began to find it expedient to buy directly from them. The packers grew in size until shortly after the turn of the century when society passed laws curtailing monopolistic actions. After laws were passed to restrict the larger plants, smaller packing plants began to spring up throughout the country. Their growth was facilitated by improvements in truck transportation, improved roads, and communications.

Following the advent of supermarkets into food retailing, they began to grow in size and were organized into chain stores in the early thirties. They purchased large quantities of meat to satisfy their increasing number of stores. Since that time, the chain stores have been handling 30% to 40% of all food at retail. In 1960, 39% of our food was sold through chain stores. One reason the chain stores have been able to grow and survive is their relatively low cost of per unit sold.

### Power of the Retailers

The current issue is the power of the retailers. The five leading grocery chains in the United States, in order of size, are the Atlantic and Pacific Tea Company, the Safeway Store Company, the Kroger Company, American Stores, and National Tea Stores. (See Table 1).

Table 1. Number of Store Operated and Sales in Millions of Dollars by Each of the Five Largest Food Chains  
1947, 1960, 1963<sup>a</sup>

	1947		1960		1963 <sup>b</sup>
	Number	Dollars (000,000)	Number	Dollars (000,000)	Dollars (000,000)
A & P Tea Co.	5,108	2,545	4,276	5,350	5,189
Safeway Stores	2,401	1,111	2,201	2,468	2,649
Kroger Company	2,516	754	1,393	1,870	2,102
American	1,921	388	795	918	- - - <sup>c</sup>
National Tea	1,201	256	534	856	1,056

<sup>a</sup> Geoffrey S. Shepherd, Marketing Farm Products, fourth edition, The Iowa State University Press, Ames, Iowa, 1962 p. 291

<sup>b</sup> Anonymous, "The Fortune Directory," The 500 Largest U.S. Industrial Corporations, 1964 Time Inc. Aug. 1964

<sup>c</sup> Not available

These stores handle a relatively large proportion of our food and, as a result, have "considerable" purchasing power. These large retail buyers employ a variety of procurement procedures. Included are: offer and acceptance bidding, forward purchasing, and standing orders. However, we must remember that they cannot offer a price below the cost of production for any length of time. They attempt to buy beef within rather narrowly defined product specifications, such as carcass weight, grade, sex, and delivery schedule. The chains consider meat as one of their main drawing attractions because of the diet habits in this country. They are constantly offering specials for different kinds of meat in order to induce the consumer to come into the store. Some stores will operate at cost or with a very low margin on meat in anticipation of making up the difference with other commodities.

### Types of Retailers

There are three broad classifications of retail stores: corporate chains, voluntary associations of independent retailers, and independent stores. Let us look at each one. First, there are the corporate chain stores, such as Safeway. These operations have a competitive advantage in some respects, but they also have a very definite disadvantage. The competitive advantage is "lower prices." This is also the image they want to convey to the consumer. How can lower prices be offered to the consumer? Fewer services are offered by transferring some of the marketing functions to the consumer. The consumer must pick up the groceries, carry them to the

counter, and then deliver them to her home. These services were performed by the old stores but the cost of the groceries was greater. The corporate chains can also reduce costs per unit by careful buying and inventory controls. They do their own wholesaling and in some cases their own processing. Their ability to buy large quantities enables them to secure a more favorable price. This results in the retailer having to contact only one processor. Another competitive advantage of chain stores is their variety of items. They handle from 5,000 to 10,000 items, and if any one item has a sudden price change, the other items will tend to compensate for any loss.

However, we must also recognize some competitive disadvantages of the chain store. The fact that they adopt certain brands and grades is not always good. Generally they have to carry some nationally advertised brands, or consumers won't come into the store. If a local competitor comes up with a new grade or idea, it is difficult to adjust the large number of chain stores very rapidly to meet the local competition or to take advantage of local marketing opportunities. The store managers cannot act without first getting approval from the central office. This may involve considerable red tape.

In order to compete with the large corporate chains, a large number of independent stores have formed voluntary chains or voluntary associations of independent retailers. These associations purchase the commodities in large lots, but each store is independent in its management. They operate in a similar manner as the corporate chains in their purchasing and distribution but are independent as far as local management, advertising, and merchandising are concerned.

The independent grocer is one who has one or two stores. He is very independent and is able to buy any brand that he can get for a bargain, plus utilizing any innovations or new merchandising ideas he desires. These are his main tools of competition.

The small neighborhood grocer will gradually become a thing of the past. He must reduce his costs per unit, or he won't be able to "survive." The consumer may feel sorry for the small grocer, but she will not purchase any items from him if those items are consistently cheaper in another store in her shopping vicinity. The same principle applies to any business.

The concern about the spread between the price paid to the processor and by the consumer is sometimes unjustified. The price paid to the processor does not include the transportation from the warehouse to the store, cutting and wrapping costs, advertising, and rental space allocated to meat in the store. These costs have to be made up by the retailer. Meat occupies more space than any other commodity besides requiring refrigeration. This adds to the costs of selling it. In addition, if a particular cut of meat is not moving, the store owner has no alternative but to lower the price and hope the consumer will buy the quantity on hand before it spoils.

An average cost of retailing a 600 pound carcass for 85 selected stores in three cities indicated that wages and salaries comprised about two-thirds of the total retailing costs (Table 2). Rent was the next highest cost item--about 8%. The remaining costs were made up in lights, heat and power, licenses and insurance, depreciation of equipment, containers and wrapping supplies, maintenance, advertising, and other miscellaneous items. Profit is also included in the miscellaneous item. There is little opportunity for much bargaining gain to come from the profit of the retailer.

---

Table 2. Average Cost for Retailing 600 Pound Carcass.<sup>a</sup>

---

<u>Item</u>	<u>Cost</u>	<u>% of Total</u>
Wages and salaries	\$48.30	66.3
Rent	5.97	8.2
Other		
Utilities	3.42	4.7
Licenses and insurance	1.75	2.4
Depreciation	2.19	3.0
Wrapping supplies	3.06	4.2
Maintenance	1.46	2.0
Advertising	1.75	2.4
Miscellaneous (includes profit)	<u>4.95</u>	<u>6.8</u>
Total	\$72.85	100.0

---

<sup>a</sup> Wayne Schulte, "Where the Consumer's Beef Dollar Goes," Cooperative Extension Service of South Dakota State University, F.S. 206

### Bargaining power

The power of individuals or organizations is evident in bargaining, as well as selling or administration. Bargaining power is the ability to negotiate with influence to bring about a desired change. George Ladd of Iowa State University classifies gain into two types: "opponent-gain power" and "opponent-pain power." (4) Opponent-gain power emphasizes a common gain for both or for one with the opponent no worse or no better off. If the product quality or pattern of marketing is improved simultaneously with charging consumers higher prices, then everyone can gain. Opponent-gain power can also be obtained by reducing marketing costs. These gains must come from profits to marketing firms, reduced wages and salaries to employees, reduced prices paid for other inputs, or increased efficiency. Generally, any gains obtained from these sources are relatively small. In specific cases, however, there might be a source of sizable gain.

The opponent-pain power emphasizes the conflict of interest and the ability to do something that will make the opponent worse off. One source

of gain is from the consumer. This can be done by charging consumers higher prices without doing anything to improve the product. However, this will generally result in a reduction in consumption.

It is the one-sided bargains in which both parties have a feeling that one party has gained at the expense of the other party which may prove to be unsatisfactory to both. The losing side may be resolved to tolerate the situation only so long as it cannot be avoided. The winning side may find itself unable to enforce performance if the agreement is too burdensome for the other. In other words, if chain stores continue to exert a power position in such a way that is harmful to the processors and ultimately the producers, they may find that they no longer have any power at all. This is not likely to happen because they want to survive and also there is the continual legal repercussions.

The bargaining power of the chain stores comes mainly from volume handling which results in reduced costs per pound of meat handled. However, if firms in the marketing arena are to survive they must bargain for quality as well as price and quantity in such a way that both parties are genuinely better off than they were before.

### The Changing Balance of Power

The changing balance of power between food processors and retailers can be explained by the structural considerations mentioned earlier. Whereas in the 1930's food processors faced only a few very large chains and organized independents, in the 1960's the bulk of their sales must be to large chains or organized independents. The greatest single force intensifying competition in food processing is that food retailers are in a unique position of being able to "neutralize" much of any market power which processors may have achieved.

The word "neutralize" is emphasized because, as we review the available evidence, the so-called "buying power" of food chains does not give them much real monopoly power in the usual sense of the word. There are still so many food retailers (about 250 chains, 800 voluntary and cooperative chains, and about 190,000 unaffiliated independents) that no one or even a few can push purchase prices below competitive levels for long, except in quite localized markets. (4) However, because so many retailers are now able to sell under their own brands or labels and can easily enter many fields of processing, they have the effect of forcing many food industries into behaving like quite keen competitors. Large food retailers are able, in effect, to enter these industries and rob them of some of their market power; often the threat to do so is enough. The result? Prices are pushed down toward costs, or, during a short period, even below costs. "Market power" at the retail level will not increase substantially by any one company because the same antitrust laws passed to curb the monopoly power of the packers will also curb the monopolistic mergers or tendencies of the food retailers.



A recent report by Harold Riley of Michigan State University indicated that cattle feeding by packers had been increasing rather slowly and by 1962 had reached about 7% of total marketings of fed cattle. (6) In the same year retailers fed about 0.2% of the cattle. Thus, the volume of cattle feeding by packers and retailers is much less than some observers would lead us to believe.

In most cases the feeding operations aren't large enough to warrant separate management. Hence retailers and packers are reluctant to feed live-stock since it adds another activity to their management problems. These units are used to produce fat animals during the slack periods when the farmers normally don't have sufficient volume to meet the demands of the market. Their general lack of interest in feeding plus producing during off-season markets adds to the costs of production. This practice will not grow too much unless the producers of livestock fail to change their production patterns to meet the needs of the consumer.

#### Processing--Power of Negotiation

The cattle slaughtering operations have become more specialized as they have moved toward the areas of production. The number of federally inspected plants increased from 494 in 1947 to 565 in 1963. While 200 of the plants existing in 1947 have gone out of business, 265 new ones have come into production. The greatest net increase in number of plants was: Colorado--11, Iowa--14, Nebraska--19, and Texas--14. South Dakota had 7 federally inspected plants in both 1947 and 1963.

There has been a decline in the proportion of total cattle slaughtered by major packing companies. In the pre-war years, the top four packers accounted for 44 to 52% of total commercial slaughter of cattle. By 1950 their share had dropped to 37%, and by 1962 to about 26%. An important factor which has contributed to the changing competitive forces is the consumer acceptance of federal grades. (5)

To some producers the decentralization of the packing plants means that there is less competition between the buyers. In the past the producer took his livestock to the central market, confronted several buyers, and accepted the highest bid. Or, as an alternative, he hired a commission firm to sell his livestock. The new decentralized plant, which usually specializes in one species and, in many cases, one type of animal, will offer a price to the producer. If the producer doesn't like the price or he thinks it is unfair, all he has to do is pick up the phone or paper and check other markets to determine the fairness of the price offered.

Using simple regression analysis with published monthly USDA data available, it was found that there was little difference between the price movements of Choice slaughter steer prices between Chicago, Sioux City,

and Sioux Falls. A 1% change in the price of Choice slaughter steers in Chicago resulted in a .98% change in the price of Choice slaughter steers in Sioux City. The Chicago price explained 98% of the Sioux City price.<sup>2</sup>

A similar analysis was made between the price of Choice slaughter steers in Sioux City and Sioux Falls. The difference was less than between Chicago and Sioux City. For every 1% increase in the price at Sioux City, the price increased about .99% on an average. The variation in the Sioux City price explained 99% of the price variation in Sioux Falls.<sup>3</sup>

These two equations show the close relationship between three market centers. These prices are also closely related to the wholesale price of Choice, grade carcass series in Chicago and New York City. The idea of one firm or market being able to pay less is not too realistic because of the mobility of the slaughter animals. This means that producers have alternative markets to sell, but the price variation in any market is closely associated with that of another market. This would indicate a greater competitive industry, rather than any one firm or market dictating the price at the slaughter level.

<sup>2</sup> The estimated equation is as follows:

$$\log Y_1 = \log .00876 + .98328 \log X_1 \quad r^2 = .983$$

(.01404)

where

$Y_1$  = Sioux City price of Choice slaughter steers

$X_1$  = Chicago price of Choice slaughter steers

There were 7 years of monthly data obtained from USDA sources. All the estimated coefficients were significant at .01 level. The figure in parentheses is the standard error.

<sup>3</sup> The estimated equation is as follows:

$$\log Y_2 = \log .01173 + .98998 \log X_2 \quad r^2 = .993$$

(.00941)

where

$Y_2$  = Sioux Falls price of Choice slaughter steers

$X_2$  = Sioux City price of Choice slaughter steers

Six years of monthly data were obtained from USDA sources. All the estimated coefficients were significant at .01 level. The figure in parentheses is the standard error.



The small packer is also confronted with trying to obtain the highest price for the carcasses that he has in the cooler. Again with the use of modern communication methods he can obtain the price of meat in any major or minor outlet he wishes. The small packer who has been in operation for a couple of years or more usually has direct channels he can sell to. He tries to build up a reputation by providing a uniform product which is consistent throughout the year. One small packer sells his heifer beef in Chicago, steer beef in New York or Boston, and cow beef in Kentucky and Tennessee. If any of these outlets become less competitive or offer lower prices than another, he will usually switch his outlets. He generally knows the price at alternative markets.

The small packer is at a disadvantage in selling to the larger chain stores because he cannot supply the volume desired by the chains. This means that if the chain store can purchase a larger quantity from one firm for the same price as several smaller quantities from several small firms, the cost of dealing with only one firm will be less and to the advantage of the chain store.

The small packers can compete by employing the latest slaughtering equipment as they build specialized plants away from the central markets. They can also compete with the larger packers by offering a specialized product, a more uniform carcass of specific weight, grade, quality, sex, and delivery date.

The decentralization, geographically speaking, has created a greater competitive atmosphere between the packers. The large packers still have their brand followers, but their products are generally a little higher priced. Also, they are operating the older, larger, and more outmoded equipment. This has tended to keep their operating costs relatively higher than the rest. The new packing plants can't compete with the larger plants in advertising their private brands or labels but compensate for this by using the federal grades and installing the latest equipment which reduces their costs per unit of operation. If one packing plant can invent or obtain a technological innovation which reduces its costs below its competitors', it will make a greater profit. There isn't any reason for him to sell his product for any less than his competitors can obtain. He may pay a little more for live animals to increase the number slaughtered to the point of reaching a maximum slaughter rate for his plant. He will continue to make the excess profit until the other plants adopt the innovation which will lower their costs also. Then the packing plants will have to bid more for the same number of live animals in order to keep their plants in operation. The producers respond to the increased price with increased production. The packers then must try to sell the increased volume and can do so only by accepting a lower price. This lower price results from the consumers' unwillingness to purchase the increased volume at the same price. The final result of an innovation is lower prices to the consumer, who eventually benefits from all technology.

## The Power Principle

The previous ideas are known in economics as the power principle. The power principle can be applied to any organization. The firm, in order to prevail in the struggle for survival, must act in such a way as to promote the power to act. The more organized a system is, the more power it will have. As a system grows, it increases its power or capacity to carry on its regular processes on a greater scale. Thus, gaining and maintaining more power is one of the major goals of any organized behavior system. If a system has this goal blocked, as the meat packing industry did, it will lose its individual power.

There is also the danger of obtaining too much power and using that power to the extent of harming others. In such a case, society will react, if the industry doesn't, by enforcing legal action. If no power is used, the risk of inaction is often more severe than the risk of action. (1)

## Implications to South Dakota

What are the implications of the ever-changing marketing channels to the South Dakota producers and packers? First, we have to recognize that South Dakota is competing with all the other states in livestock production. We have about 3.8% of all the cattle, 2.7% of all hogs and 5.8% of all sheep. This isn't enough to give all the producers of South Dakota alone sufficient power to control any prices. Producers and processors must find better methods of determining what the consumer wants and then produce it with a minimum amount of expense.

In Nebraska, a packing plant is discovering that if the producers know more about their product, they will alter their production to meet the market specifications. If a change is desirable, it will be more readily made. "There was never any question in the minds of the stockholders about the quality of cattle that would be processed, for the plant is located in an area noted for choice fed cattle. In order to stay in business, the stockholders knew they had to hold processing costs down, and at the same time pay the consignor more than he could get from other markets. Thus, it was decided to handle beef on a grade and yield basis only. There has been no deviation from this decision and it has paid off. The only deviation, if it might be called that, is that a seller gets the average dressed beef price for the week his animals are processed rather than the price for the day they are sold." (2)

As a result of this procedure, the producers have shortened their feeding period in order to get the most desirable carcasses and the size in demand. By getting the carcass data back, the producers know how different feeds affect carcass quality, and they are finding they can get the job done cheaper with certain feeds. The more information that each

processor or grower can gather, the better decision each entrepreneur can make. If each producer were able to know how each of his animals was accepted by the consumer, he would be in a still better position to alter his production accordingly. This is virtually impossible, but every effort should be made to obtain as much information as possible. The major means of transferring the information concerning different grades and the acceptance by consumers is with the price system. This is the best system we have at present, although sometimes it reacts a little slowly.

The livestock industry is so dynamic that keeping abreast of these changes is a major task. The producer, packer, processor, and retailer who stand still do not survive. Those who recognize and adopt new production and marketing practices will survive. The increasing emphasis on specification buying by the chain stores will eventually force the producers to produce a certain quality to be delivered at a specified time. The producer who recognizes this first and adapts his production to meet the market requirements of quality, quantity, and time requirements will receive a premium for his efforts. Remember, it is always the first one who adopts a new cost-reducing practice successfully who reaps the excess profit.

The trade has to recognize that the advent of new products, such as soybean meatless meats, new cooking processes with infrared stoves, and new methods of preserving foods by radiation will drastically change the pattern of marketing. The housewife is going to continue to want the same or a "better" type product in the stores. This may involve more precooked foods, making the chores in the kitchen easier. She will gladly pay a lower price for the same quality of any meat product if she is given a choice.

Various companies are trying new product combinations all the time. For every 10 new products that are tried, 8 fail. Consider all the T.V. dinners which have various types of meat in them. The return to the farmer for the meat in this type of product is relatively low. Look for many new changes in the food processing field that are the by-products of space technology. The new concentrated foods require a great deal of processing but very little preparation at home. This adds to the cost of marketing, but the house wife desires these changes and the firms who do not adapt or recognize these changes will find themselves in trouble.

### Real Market Power

It is the consumer who has the real power and the final word after the product is on the market. The supermarkets are trying to provide the following practices only to lure the consumer into their store. They provide only the services they think the consumers want and no more. Their stores are well lighted with attractive meat displays. They provide music, great variety in stock, and generally a large parking lot. If the products and services do not please the consumer, she finds another place to shop where the needs and desires will be met.

The volume buying of the large supermarket chain stores and affiliated chains has increased the pressure of providing the proper grade, sex, and quantity at a given time only to keep the consumer satisfied. If the packer doesn't meet these requirements, he stands to lose that particular outlet. The pressure is passed back from the packers to the feeders, then to the producers, then to the breeders. The real pressure comes to the marketing firms which resist the change desired by the consumer. Any service provided in the market channel is ultimately dependent on whether or not the consumer decides to purchase that item in "that form" at "that price" and at "that time."

#### REFERENCES CITED

- (1) Alderson, Wroe. Marketing Behavior and Executive Action, Richard D. Irwin, Inc. Homewood, Illinois, 1958. p. 51-60.
- (2) Anonymous. "Answer 3 Years Later." Beef. Grundy Center, Iowa. Vol. 1, No. 2, November 1964.
- (3) Kohls, Richard. Marketing of Agricultural Products, Second Edition. The Macmillan Company. New York, 1961. p. 16-23.
- (4) Ladd, George W. Agricultural Bargaining Power, Iowa State University Press, Ames, Iowa. 1964.
- (5) Mehren, George L. Address by Assistant Secretary of Agriculture at the annual meeting of the Colorado Cattle Feeders Association, Brown Palace Hotel, Denver, Colorado. February 6, 1964.
- (6) Riley, Harold. "Some Emerging Problems in Beef Marketing." Michigan Farm Economics. Department of Agricultural Economics. Michigan State University, East Lansing. No. 260. September 1964.
- (7) Shepherd, Geoffery S. Marketing Farm Products. Fourth Edition. The Iowa State University Press, Ames, Iowa. 1962. p. 302-303.

## MEETING CHANGES IN CONSUMER TASTES

Harold J. Tuma \*

Animals come in assorted sizes, shapes, ages, weights, sexes, and degrees of finish. If one were to consider all of the combinations of these factors which could occur in the carcass, it readily becomes apparent that there is extreme variation within any single specie. A heterogenous product is very typical of any biological material. Today, it would not be advantageous for the livestock industry to have meat merchandised in such a motley mixture because the consumer desires a uniform product, consistent in quality. This means some sorting or grading is required before the product is offered for retail sale.

What Should Grades Accomplish?

Grading sorts a heterogenous supply of a commodity into smaller, more uniform or homogenous groupings of units. The characteristics used for making up one group are relatively different from those in another. The differences between groups must be seen visually or be measurable by objective methods. To be useful in the marketing process, grading must be based on factors that are important to buyers and sellers and which affect the final use of the product. This means that grading is also the process of dividing a commodity into groups or units which differ in value. In other words, a grade labeled Choice should have more desirable characteristics for consumption than a grade labeled Good.

An optimum or perfect grade standard would separate the products into homogenous groups so that each individual within each grade would be worth exactly the same amount per unit of measurement (per pound, head, etc.). Grade standards should be simple, easy to understand, practical, and conform as closely as possible to the existing trade practices.

Grade standards for all species should:

- 1) serve as guide posts for the industry. Producers, livestock judges, packers, marketing agencies, and educators need a common source for distinguishing and understanding the value differences of our meat animals and products.
- 2) provide a basis for communication in the industry. Without grades our entire market news service would be virtually meaningless because of lack of common nomenclature and standards.

---

\* Assistant Professor of Animal Science, South Dakota State University.

- 3) bring about meat animal improvement. Standards which consider economically important live animal and carcass traits are necessary and would provide guide lines for the various breed associations and programs.

A system of grades provides a mechanism for sending more effective price signals up and down the production-distribution line. For example, higher prices for the kind of beef that meets with consumer favor becomes a stimulus for producing more of these kinds. Thus, a grading system should help a market pricing system operate more efficiently.

### Slaughter Grades

The official standards for live cattle developed by the United States Department of Agriculture provide for segregation first, according to use-slaughter, feeder and stocker; then as to class, which is determined by sex condition; and then as to grade, which is determined by the apparent relative excellence and desirability of the animal for its particular use. The classes of slaughter cattle are steers, heifers, cows, bulls, and stags. Certainly there is little question but what we are most concerned with the steer and heifer classes, although there now is a great deal of interest being generated in production of young bulls and stags and how they compare to steers and heifers. The discussion in this paper will deal only with the steer and heifer classes. The specific grade of the slaughter animal is determined by an evaluation of factors which appear to influence carcass excellence - conformation, finish, quality, and maturity.

Conformation refers to the general body portions of the animal and to the ratio of meat to bone. While conformation should primarily be determined by the inherent musculature and skeletal system, it is also influenced by degree of fatness. In fact, we can say that fatness has much more to do with the conformation of an animal than any of us would like to believe. I am sure you all have heard the old term, "fat covers up a multitude of sins," and certainly this is a very true statement. The grade standards state that, "excellent conformation in slaughter cattle is denoted by a compact, wide-topped, square-rumped, and full-quartered individual that is thickly fleshed. Fullness and thickness should be especially evident in the proportions of the body producing the more desirable cuts of meat, the loins, ribs, and rounds." This wording, particularly the portion calling for a compact, wide-topped individual, is a bit antiquated; without doubt at present we would all descriminate against these terms, as they indicate excessive finish.

Finish refers to the fatness of the animal. The quality, quantity, and distribution of finish of the slaughter animal are very closely associated with the palatability and quality of the meat which it will produce, according to our slaughter grade standards. Thus, finish becomes the most important single factor affecting the grade of slaughter cattle. External finish is evidenced by fullness and apparent thickness of the fat covering over the back, loin, ribs, rump,



and round. Also, fat deposits giving fullness to the brisket, rear flanks, and cod or udder, while varying decidedly with breeding of the animal, are useful indicators of internal finish.

Quality in the live animal refers to the refinement of hair, hide, and bone and to the smoothness and symmetry of the body. Quality is more closely associated with carcass yield or dressing percent than any other factor. A high degree of quality in slaughter cattle is denoted by smoothness of fleshing, relatively small bones, neat joints, neatly laid-in shoulders and hips, refined hair, and pliable hide. Quality in the live animal is not indicative of carcass quality.

The degree of maturity of slaughter cattle is based on the physical characteristics indicating age. Youthfulness and fatness of the slaughter animal are each credited with having a desirable effect on the palatability of meat. Therefore, within certain limits the standards for slaughter cattle allow an increase in finish to compensate for advancing degrees of maturity. The same is true for carcass beef.

Each animal graded presents a different combination of a "grade determining" factors. It is not unusual to find an animal of one grade that has some of the characteristics associated with another grade or grades. Therefore, a composite evaluation of the total inherent physical characteristics of the animal is essential for accuracy in determining grade.

The designation of slaughter cattle grades is usually made by classes. Since the same standard is applied to carcasses from steers, heifers, and cows without class identification, these three classes are also combined in the slaughter cattle grade descriptions. Bulls and stags are always identified as to class in both carcass and slaughter cattle grading, since meat from these classes is never interchangeable with meat carrying the same grade name from steers, heifers, and cows.

### Carcass Grades

Carcass beef is graded on a composite evaluation of three general grade factors: conformation, finish, and quality. However, since the contribution of finish is primarily through its influence on both quality and conformation, there is merit in simplifying the analysis to the major factors - quality and conformation. The application of our federal standards also state that only on unribbed carcasses do we consider finish. Since 95% or more of our carcasses are graded on a ribbed basis at present, this also means that finish is an unnecessary consideration.

Conformation, as considered in grading meat, refers to the proportionate development of the various parts of the carcass or wholesale cut and the ratio of meat to bone. Although primarily a function of the development of the muscular

and skeletal systems, conformation is also affected by the degree of finish. Thus, conformation is designed to measure the relative proportion of more desirable to less desirable parts and the proportion of edible to nonedible parts, the same as in the live animal. It is questionable, however, whether an increase in grade really increases the proportion of more desirable parts.

The relative desirability or expected palatability of the meat in a carcass or cut is expressed in the general term quality. It is a characteristic of both the lean and the fat contained therein and is the most important criterion of palatability. Quality is measured primarily in terms of 1) marbling, 2) texture of the lean, 3) firmness of lean, 4) maturity, and 5) color of the lean. Of these various quality factors, marbling and maturity are the most important. Marbling refers to the fat within the muscle, or we can say it is the flecks of fat that we see scattered throughout the cut surface of any muscle. Maturity refers to the evidences of physiological age in the carcass as distinguished from the actual age of the animal from which the meat is derived. The principal evidences of maturity are obtained from color, size, and shape of rib bones, ossification of the cartilages at the ends of the chine bone, ossification of the cartilagenous connections of the sacral vertebrae, and color and texture of the meat. Excellent quality in meat, as evidenced in the cut surface, usually implies a full, well-developed firm muscle of smooth, fine texture and bright color containing a modest amount of marbling or flecks with the muscle.

### Consumer Preference

What does the housewife consider when she purchases meat items? Or possibly we might ask the question - does the housewife do most of the purchasing of these items? We usually assume she does and our research studies bear this out. The housewife purchases two-thirds to three-quarters of the total meat consumed. Occasionally the husband does the shopping and a small percentage of the buying decisions are made together. For the purposes of this paper, however, let's discuss what the housewife considers when purchasing retail meat cuts. Let's also assume that price will not be considered in the housewife's decisions.

Several factors rank high in the housewife's mind when deciding whether to accept or reject a retail cut of meat. In recent years, emphasis has been placed on producing a lean, meat-type carcass with a minimum of fat. From our consumer surveys, this certainly is justifiable. The housewife places leanness of the retail cut very high, in fact in most studies it is on top of the list of those factors she considers when purchasing a retail cut of meat. Most people shy away from excess fat because of: 1) the greater quantity of calories in fat than in lean, 2) greater cooking losses, and 3) medical reasons. The next factor she may consider, and many housewives consider this as important as any other factor, is the color of a piece of meat. An acceptable colored piece of beef would be a bright, cherry red color; pork, a light pink; and lamb, a dark pink to a light red. We should also mention that housewives do discriminate against yellow fat although the yellow



is not discriminated against in the grade standards or taste panel tests. The housewives associate the hard, white, flakey fat with quality. Other factors, of lesser importance, mentioned by the consumer are grade, amount of bone and the federal inspection stamp. Actually, some of the more important things that the housewife considers are not very closely related to eating quality.

What does the average consumer know about beef grades? Of most of the people that have been polled, only three beef grades at a maximum could be named. Those grades which the consumer was most familiar was the Choice, Good and Prime, in that order. Studies have shown that consumers prefer Good grade beef over Choice or Prime. Again, the main reason given is less fat on the Good grade beef than on the other two grades.

A Wisconsin study has indicated that people prefer to purchase pork which is very lean with no marbling. However, once it is prepared they find that their taste buds dictate a preference for meat with some marbling because of its tenderness and juiciness. I believe we might sum up the views of any consumer by saying that a retail cut of meat must be attractive and appealing to the eye. This includes a multitude of factors including color of the lean, color of the fat, the manner in which the cut was prepared and packaged, and even the way it is presented in the display case for sale.

A couple of years ago in our pork preference study at the State Fair, we asked consumers to tell us which of four pork chops they would prefer to buy. Strangely enough they were selecting a chop which was about in the middle of our size range. Most of the comments, as to the reason why these women were picking this particular chop, indicated that it was the most attractive chop. Even though they were to select the chops with respect to size, they still could not forget the attractiveness. The same thing occurred in their preference for boneless hams. They were to select the one which they preferred on a weight basis. However, one ham did have a little more attractive color and was more appealing to the eye. As a result, this was the one that the housewife would select. So, again, this points up the fact that if the housewife is to pick any retail cut of meat, price not considered, the cut must be attractive and appealing to the eye.

#### Relationship of Slaughter and Carcass Grades to Consumer Preference

The relationship of our slaughter grades to carcass grades varies a great deal with species. Some of our work with beef indicates that we do not do a very accurate job of predicting the carcass grade from the live animal. We must remember that this is on an individual animal basis. If we were to evaluate pens of animals, collectively, we could do a much better job, and most of our animals are sold in this fashion.

The accuracy of predicting the grade of our beef animals is lower than we desire because of the importance of quality in determining the over-all carcass grade. In the upper beef carcass grades, conformation cannot compensate for

lack of quality. The quality portion of the grade is determined predominantly by looking at the cut surface of the muscle and observing the amount of marbling on the cut surface of this muscle. At present, there are very few accurate external indications of the amount of marbling we might find in this animal. The amount of external fat cover is used by buyers at present as one of the best indications of carcass grade. We find many exceptions to this indicator. Animals with a minimum amount of outside fat can be well-marbled and grade well while those with the maximum amount of outside fat cover can also have a minimum of marbling.

The lamb and pork carcass grades are easier to predict by looking at the live animal. The main reason for this is that conformation or some of the visual linear characteristics are more important in determining the final grade than in the beef animal.

During the last few years we have seen vast changes in our methods of evaluating slaughter cattle. All of these changes have been associated with new knowledge in identifying or defining factors associated with value. Each advance has directed us to be more critical in our evaluations of the beef carcass. Grade has been long used as a marketing tool and thus, a method for evaluating both live cattle and carcasses. Grade by definition, as was mentioned earlier, refers to a group of materials similar and of the same relative rank, value, or quality. This implies that where grades are used, and in the case of beef carcasses, that we have segmented them into groups which should be similar in the characteristics and value. If this is true then grade should be an excellent tool for use in measuring the value of the beef carcass which in turn should reflect consumer preference. Let us examine our present beef grades in this respect. The external finish is related to the conformation (more finish tends to give a higher conformation grade) and the quality grade given on-hoof.

This external finish is usually trimmable fat on the carcass and may seriously decrease the carcass value because of this excess finish. The greater the external finish, the greater the fat trim at the retail outlet. This means a higher retail price and a decrease in retail profit or even loss to the retailer.

The bright side of this situation is that we can and do produce animals with the quality desired without the extreme amount of external finish. At present there is little demand, at least in the Midwest, for Prime grade carcasses. This lack of demand is reflected in price since they sell for only a little more per pound than for Choice grade. Among the other grades, however, the price differential is greater -- Choice sells for more than Good, etc. We must also appreciate that these values have been established on the average value for all carcasses falling with each grade. It is also well-recognized that there is more variation in value within a grade than between grades. This means that the criteria for grades established earlier in the paper are not presently fulfilled. There is about a \$2.50 spread between Choice and Good. Considering these Choice carcasses, there may easily be a 7% or more spread in the retail yield. The

USDA publishes, each month, a composite price for retail cuts of beef. Currently this figure is 78¢ per pound. If we consider fat and bone to be of little value, we can quickly calculate the difference in the value of two Choice carcasses varying 7% in retail yield. This simply means that in each 100 pounds of carcass we have 7 more pounds of retail cuts to sell at 78¢, or a difference in value of \$5.46 per hundredweight. This far exceeds the differences in values now quoted between Choice and Good. In fact this amount closely approximates the total difference in value between Choice and Standard. Our present grade standards blend conformation and quality together and disregard quantities of fats other than those related to meat quality. These grades segment carcasses only very grossly in terms of value and, therefore, are of little use in expressing the desires of the consumer. In fact in many of our carcass contests the Prime carcasses may be disqualified (due to excess finish) and the top selections be in some portion of the Choice grade.

Quality of beef refers to its tenderness, juiciness and flavor. The ultimate measurement of beef quality can be accomplished through palatability testing panels or consumer panels. We attempt to predict these palatability qualities (eating characteristics) by observing some of the carcass characteristics. Quality in our beef carcass grading standards refer to the eating quality characteristics that a piece of meat might have. The quality characteristics of the live animal, however, are not related to the quality of the carcass or eating characteristics of meat. Quality has been associated with the maturity of the animal, marbling, color, texture, and firmness of the muscle. From the results of our research studies involving meat quality traits, it appears that maturity and marbling are most closely associated with the eating quality of beef and that we must continue to use them in evaluating the beef carcass. Color and texture are of economic importance since they are related to consumer preference. Their effect in the sale of beef makes it imperative that they be considered in the grading system.

In summary, our present live and carcass beef grades do not reflect the consumer preferences as well as we would desire. The main problem is that external finish, as it is related to the cutout value of the carcass, is not considered in our federal standards. This same point may also be stated regarding our lamb standards. The trend in our hog grading is a step in the right direction although these standards are a bit antiquated and could be revised. As research information becomes available, it should be implemented to up-date our grading standards in order that they might more adequately fulfill their objectives.

The present-day consumer has an aversion to fat and desires lean, meaty retail cuts that are tender, juicy, and flavorful. It may be that we should not cater completely to the consumer and his desires. If we did, the quality standards would be relaxed to the point that the eating qualities would be impaired and this in the long run would hinder the per capita consumption of meat and in turn the livestock industry. Although changes appear to be warranted, any revision should be an improvement, in keeping with the objectives for grades and based on factual research information.

## MANAGING CHANGE IN MARKETING

Wayne Schulte \*

"To market, to market, to buy a fat pig . . . "

"Simple Simon met a pieman, going to the fair . . . "

"Jack Spratt could eat no fat . . . "

These jingles tell us something about marketing in Old England. Simon's "fair" was not of balloons, merry-go-rounds, and livestock judging. It was a village market. His fair-market, as everyone knows, had rules of trading that permitted no credit. Jack Spratt and wife already were conscious of fatness vs. leanness in meat.

Marketing has advanced far from the village-fair concept but in our world today it is of much concern. Farm products and especially livestock are high on the list of commodities traded by farmers and ranchers. Because of the limited market outlets available to them, they find their economic welfare tied up in the marketing process. Nearly every farmer and rancher spends a part of his time buying and selling. Accordingly he gives careful thought and consideration to the marketing process.

Sometimes the marketing transaction itself is a brief moment of drama. A hog producer's 6 months profit may rest on the minutes during which his animals are bid off to the packer. And the suspense of whether the rustlers will be caught in a TV show is no less than the real life cattleman's concern whether his shipment to Sioux Falls brings 22, 23, or 24 cents a pound.

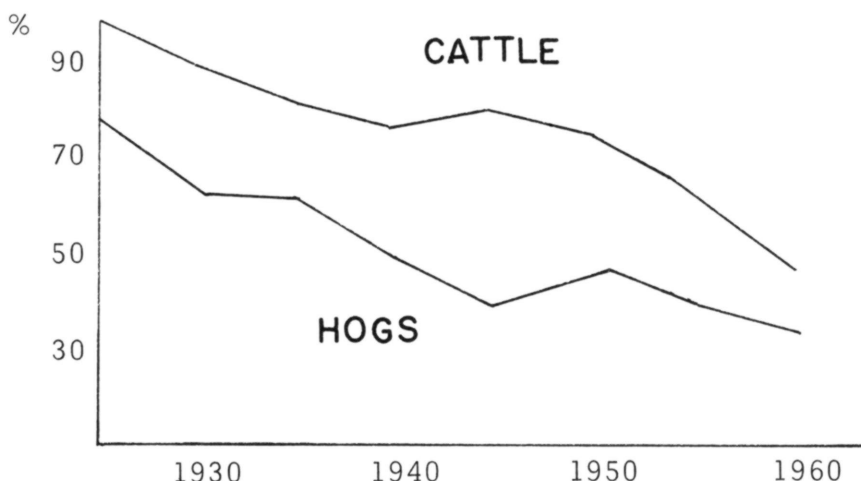
And as we think of the traditional concept of a good market for farm products, many think of the lineal descendent of Simple Simon's fair - it is a market where many buyers and sellers come together to exchange goods. This is the idea of the central market. Its growth in the United States during the last century was favored by the rise of railroad transportation. As railroad lines reached out radially from the big cities, products were brought together at central terminal markets. Similarly, when a new form of transportation, the motor truck, came on the scene, it had much to do with the decentralization of markets.

Simon's concept of a market is losing its importance as a marketing method in the United States. In 1925, over three-fourths of the hogs processed under federal inspection were marketed through terminals. By 1961, only 29.2% of these hogs moved through terminal markets. Marketing of cattle through terminals for federally-inspected slaughter fell from just over 90% to less than 50% in the same period. The greatest shift in slaughter cattle marketings has taken place since 1950. (See Figure 1)

---

\* Extension Marketing Specialist, South Dakota State University.

Figure 1 - Percentage of Cattle and Hogs Sold Through Terminal Markets.



The idea of central exchange markets still dominates much thinking about marketing. It is a common "mental point of reference." Also, most government services in marketing, such as market news, were initially designed to accompany central market trading.

Nevertheless, decentralization of markets is not the radical change in marketing as is sometimes supposed. The reason is that the truck, telegraph, and telephone have made it possible for local-market or direct selling to be almost as competitive as terminal market selling. Direct selling is an important part of the cattle business, especially in the western areas of the United States. Meat packers across the country report that 38% of their cattle were purchased direct in 1961, 19.7% through auctions, and 42.3% through terminals.

In South Dakota as in most other areas of the United States, livestock producers have alternative market outlets available to them. Besides terminal markets just mentioned, these include auction markets and various forms of country selling. Country selling includes sales by farmers and ranchers direct to packers, to livestock dealers, and to other farmers.

One of the most dramatic changes in the livestock marketing system during the last 2 1/2 decades was the rapid growth in the number of livestock auction markets. The number of sales of all livestock through auctions increased about 235% from 1940 to 1963-64. The number of auctions increased in this state from 53 to 59 during the same period. (See Table 1). The greatest increase came from an increase in the number of cattle being sold through auctions followed by sheep and hogs.

Table 1. Livestock Sales Through South Dakota Auctions,  
1940 - 41 and 1963 - 64

	Number head sold		% increase between the 2 periods
	<u>1940-41</u>	<u>1963-64</u>	
Cattle	352,131	1,467,125	317%
Hogs	374,848	1,005,135	168%
Sheep	148,372	457,769	209%
Total number of livestock	875,351	2,930,029	235%
<hr/>			
Number of auctions	53	59	+6

When selling through terminal and auction markets, an expert does the selling for you; you only need to know the marketing charges.

When selling direct to a local buyer, you do the selling. Direct marketing has been responsible for many of the innovations in pricing and processing of cattle. At one extreme you have the traditional live animal priced and paid for on the hoof. At the other extreme the animal is consigned to a packer unpriced and paid for when the chilled carcass moves out of the packer's cooler into the meat trade. In between these two extremes is a method that invites controversy whenever mentioned. This is the grade-and-yield selling method. The buyer specifies a price for each grade and yield before the animals leave the feedlot. When agreement has been reached by the buyer and seller on prices for each grade and yield basis, the animals are delivered to the slaughter plant. Payment, however, usually isn't made until the dressed weight and grade are determined, although some packers will make partial payment the day the cattle are delivered.

Livestock producers and packers alike understandably want to remain flexible in their buying and selling. They want to keep several market channels open, to maintain their bargaining position. The continued resistance to direct selling can possibly be traced back to the traditional idea that a good market for farm products is a lineal descendant of Simple Simon's fair. It is a market where many buyers and sellers come together to exchange goods. But with tighter margins both in the producers and processors activity, it seems that the age old method of assembling products for personal inspection and haggling between the owner and the buyer are about to change. Certainly the cattle feeder selling direct in Colorado is nearly as well informed and in about as good a bargaining position as the South Dakota feeder who ships to Sioux City or Sioux Falls.

More important than changes in physical location of marketing have been the new developments in the way marketing and the price-making process is carried on. As pointed out, the system by which livestock products move into and through marketing channels is a diverse one. Moreover, as time passes it becomes ever more complicated.



The choice of a market for livestock products hinges on several factors. With a number of market outlets easily available, the producer is often confronted with a decision as to which market is the right market for him. This is a decision the producer or feeder must make every time he has an animal or a lot of animals ready to go to market. A market that may have been the most advantageous for the last shipment of animals may not be the right one for the next load.

A wrong decision as to the choice of market can be quite costly and certainly merits as much attention as decisions concerning choice of breeds, feed methods, and other management programs. Many factors may be involved in reaching a decision, but in general, the final determination of where to sell depends on a few major factors such as relative price, convenience, custom, and the producer's personal likes and dislikes.

Since the marketing decision is made only a few times a year for most producers, some time can be profitably spent in working out a market selection procedure. The marketing decision based on the results of such a procedure does not take into account other factors than net returns, but once the market that shows the highest net return is determined, other factors can be evaluated and the final decision based on all factors. A simple market-selection calculator as indicated in Figure 2 provides an easy sequence for arriving at the net price received for a lot of animals.

Figure 2 - Procedure for estimating the net price of alternative markets

PRICE AND COST FACTORS	Markets		
	Example	A	B
Quoted Market Price / cwt.	\$ <u>17.00</u>	\$ <u>      </u>	\$ <u>      </u>
Transportation Cost / cwt.	<u>.50</u>	.....	.....
Estimated Shrink Value / cwt.	.35	.....	.....
Marketing Charges / cwt.			
Yardage .20	.....	.....	.....
Commission .12	.....	.....	.....
Feed .05	.....	.....	.....
Other <u>.08</u>	.....	.....	.....
Total Marketing Costs / cwt.	<u>.45</u>	<u>      </u>	<u>      </u>
Net Price to Producer	\$ <u>15.70</u>	<u>      </u>	<u>      </u>

Certainly the quoted market price is the place to start in making the marketing decision. These prices may vary a great deal among markets in the same area. Quoted terminal prices may exceed locals more than direct prices in many situations. Taken alone, these price quotations may be misleading for, other things being equal, it is the net price received which is of importance to individual producers.

Next, consider the cost of transportation. Truck rates and methods of charging varies so in different areas that it is difficult to give representative transportation rates.

However, many producers who haul their own livestock to market fail to consider the cost of this operation. The minimum costs which should be assessed are those of operating the vehicle.

Weight loss due to shrinkage should also be a consideration. Shrinkage cannot be avoided when marketing livestock, but there are some things that can be done to minimize the economic loss.

First of all reduce time in transit. And this includes the time animals stand on the truck waiting to be unloaded. Arrive at the market at a time to avoid waiting in line. Load and unload without exciting the animals, and finally, if you have a choice of markets, take the differences of shrink into consideration by comparing the expected amount of net shrinkage.

There has been considerable research into the reasons for shrinkage and the relative amount of shrinkage under various handling conditions. It has mainly shown that shrinkage is difficult to predict. There is wide variation in the amount animals will shrink even when they are handled under the same conditions. Some conditions are known to result in more shrink than others but rules of thumb are a poor guide. Recent research does make it possible to put together some guidelines.

Data from a recent Ohio study reconfirm the well known fact that animals tend to shrink more as distance and time in transit increases. And as other studies have shown, the greatest amount of shrink occurs, relative to distance and time, on the short hauls. However there are other factors besides time and distance that affect the amount an animal will shrink on the way to market.

Another factor which plays a part in the amount of shrinkage is whether or not animals have been on feed and water up to time of shipment. In the Ohio study every length of haul classification where animals had access to feed and water up to loading time the shrink was considerably more.

The Ohio workers also studied effects of temperature differences and tranquilizers on shrink. They found that temperature may not have as important

an effect on the choice of a market day as commonly thought in the past but that extreme temperature changes should be avoided as much as possible. Tests on steer and heifer feeder cattle on a long (5-day) haul indicated that tranquilizers given prior to shipment have insignificant effects on shrinkage. On a shorter haul (95 miles) tranquilized animals did shrink significantly less than the control group which would indicate that the effects of the drug probably wear off after a short time.

Marketing at terminal and auction markets involves various costs for the associated services provided. These costs should be considered when making the "where to market" decision. This does not mean that there is no cost to operating a direct buying market since charges are not directly assessed, but such costs are born by the operator from his operating margin.

### Protection of Market Exchange

The system of marketing farm products has proved fluid and capable of adjusting to new challenges. The traditional market exchange has been relied on for generations as the basic method for farmers and middlemen in buying and selling farm products. The idea that there shall be free and open market exchange, with many buyers competing vigorously for the products offered, is a deep seated one. It embodies many of our principles of freedom, equality, and justice.

Laws of the land have long been directed to preserving competition in markets. The Packers and Stockyards Act, which provides for regulation of the marketing of livestock and poultry has that objective. This law is not only concerned that free competitiveness will exist; it also prohibits a large firm from acquiring too much power in either its supplying or distributing markets. For example in the Packer's Consent Decree of 1920, it specified that meat packers would not own or operate stockyards, and that they would not engage in retailing. The various laws and regulations have had much to do with preserving a system of market exchange for marketing farm products.

### Livestock Market News

Market news plays an important functional role in the marketing process by making current and unbiased price and receipts data available to producers of livestock. Market news brings together available information on the key factors that make up a market. These factors are: (1) supply, (2) range of quality, (3) demand, and (4) range of price. This information gives the individual producer reliable and timely information upon which to base his decision of when and where to sell his livestock.

Most of the value of market news reports depends upon rapid dissemination. It is of prime importance that this news reaches the producers in the shortest time possible. A nationwide teletype system that connects all of the offices coast to coast permits U. S. Department of Agriculture reports to be released at the same time.

Television and radio are two of the most popular methods for disseminating market news. Radio has been a popular media for many years, with television playing an important role in more recent years.

Although it cannot be classed as market news, the Agricultural Marketing Service compiles a large amount of statistical data on livestock and releases reports on such things as size of the spring and fall pig crops, the numbers of lambs and of cattle on feed, and the estimated numbers of livestock on farms. Such material is available and can be used to good advantage in planning production and marketing programs.

### Too Many in Between

Without a doubt, U. S. Agriculture will be forced to respond to the urgent demand that its products be marketed with more regularity and uniformity. There have been many changes in methods of marketing as mentioned previously. But more and more farmers are beginning to find it more economically advantageous to produce to specifications. It is likely that this trend will be more pronounced in the future.

Many of the changes that call for more orderly marketing fall in the broad category of vertical integration. This is essentially telescoping two or more of the stages in marketing. This is done by combining the stages within a single ownership (including cooperative ownership), as when a meat packer feeds cattle in his own feedlot; or by some kind of contractual arrangement as in many hog production-feed company contracts.

Through vertical integration a processor, distributor, or retailer assures himself of the kind of supply of farm products he wants by controlling the basic production. However, we are not concerned with vertical integration but rather how some of the processes within the marketing process might be combined without reducing the competitive market system.

The remainder of this presentation will be devoted to: (1) the economic implications of live animals and dressed meat freight rates, (2) centralized processing of fresh meat for retail stores, and (3) a new and unique method of marketing lamb. All three of these alternatives would reduce the amount of marketing costs from producer to consumer.

### Economic Implications of Live Animal and Dressed-Meat Freight Rates

In attempting to reduce the cost of marketing a product one of the most obvious methods is to reduce bulk. Reduction of bulk to nearly half the live weight is relatively easy with livestock products. For sheep and lambs less than 50% of the live animal results in a dressed carcass. For calves and slaughter cattle the average dressing percentage ranges from approximately 50% to as high as 65%. Hogs will dress 75 to 80%.

The possibility of increasing income to the state by slaughter of livestock and shipment of meat presents the least opportunity in the hog industry. The reduction in weight is least because of a 75-80% dressing percentage plus the fact that during the past 5 years about 70% of the hogs have been slaughtered within the state.

On the other hand about 50% of the sheep and lamb produced in South Dakota are slaughtered here with even less of the cattle slaughter performed within the state. For the 5-year period, 1958-62, about 43% of the state's production was slaughtered here.

We consume even less of the livestock we produce -- 11% or less of each specie. However, we consume 27% of the beef we slaughter, 19% of the lamb and mutton, but only 8% of the pork. Therefore the remaining portion of these slaughtered products are shipped out of the state. With only a relatively small expected increase in population within the state, whatever growth can be generated in slaughtering facilities will depend to a great deal on our competitive position in terms of transportation of the processed products.

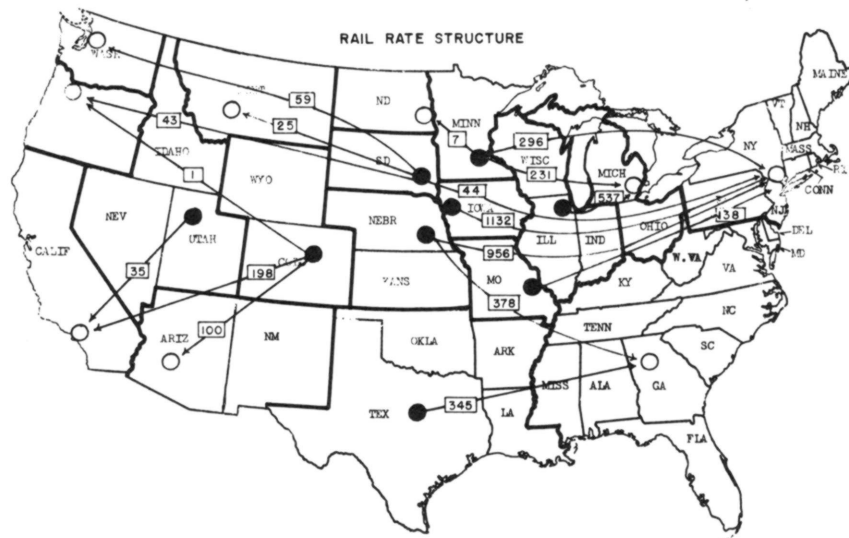
In 1963 South Dakota produced 4.5% of the beef and veal, 4.6% of the pork and 5.8% of the lamb and mutton of the national total. The state slaughtered 1.8% of the beef and veal, 4.2% of the pork, and 2.6% of the lamb and mutton. As a consumer of livestock products the percentage is even less. We consumed less than .5% of the beef and veal produced in the U. S., .6% of the lamb and mutton, but only .3% of the pork produced.

Increases that the state experiences in production and slaughter of livestock will be evaluated in terms of the locational advantage resulting from transportation cost relationships. South Dakota has been a net exporter of all its processed livestock products and any increased volume of processing within the state will be exported.

In a study conducted by North Dakota State University, distribution plans were derived for shipments of dressed beef for 1950, 1954 and 1958. Plans for 1958 indicate the line dividing east-west shipments lay near the eastern South Dakota border. Therefore the Sioux Falls area can ship about equally well in either direction depending upon the demand of the product. With increased population shifting to the western areas of the United States, shipments of beef from South Dakota will principally go west.

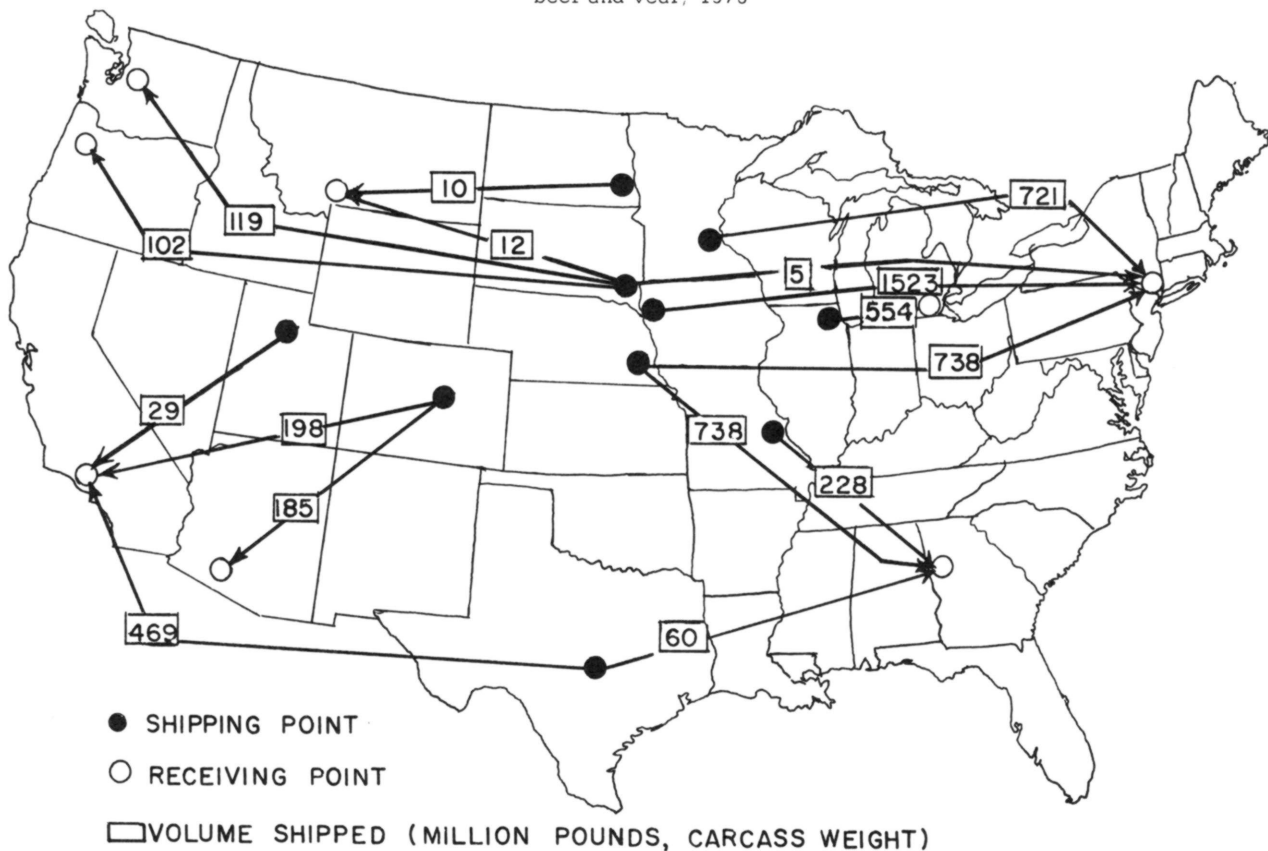
An estimated distribution pattern for 1975 was also projected that would be most efficient for assumed levels of production, slaughter and consumption for that year. Slaughter volumes in each region in 1975 were assumed to be about 30% greater than in 1958. Directions of dressed-beef shipments were very similar to those for previous years. South Dakota shifted more of its locational advantage to the west coast.

FIGURE 3. OPTIMUM INTERREGIONAL DISTRIBUTION PATTERNS IN DRESSED BEEF AND VEAL, 1958



- Shipping point
- Receiving point
- Volume shipped (million pounds, carcass weight)

Figure 4 - Interregional distribution patterns in dressed beef and veal, 1975



Source: Thor A. Hertsgaard, "Distribution Patterns for Beef," Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota, Bulletin No. 435, June 1961.



A comparison of the major meat exporting regions indicates the locational advantage is not likely to be the dominant factor in interregional competition. It is likely such factors as interregional differences in costs of production and the relative profitability of alternative enterprises may be of greater relative importance. However, production cost advantages of a given exporting region would be additive to the locational advantages of marketing and would either offset or augment that advantage.

### Centralized Processing of Fresh Meat for Retail Stores

At present most supermarkets process fresh meat at each store into retail cuts that are weighed, priced, and packaged ready for sale from self-service refrigerated display cases. This self-service system of selling meat was adapted during the 1940's and became well established during the early 1950's. The improvement of handling techniques by this system appear to have reached a plateau in terms of further operational efficiencies. Improvements in food handling practices have led to a concentration of effort in examining the feasibility of the central handling and packaging of meat.

Central packaging and distribution of retail meat cuts is currently being practiced in England. For example, one plant has been successfully supplying \$100,000 per week of fresh meat to 30 stores. They do not use meat preservatives.

There are as yet several problems that will need solving before such an operation is feasible for use in the United States. Market researchers are seeking ways to prolong the shelf life of meat. With the long distances involved in this country, keeping delivery distances and time fairly short are requirements to be overcome.

An interesting item about the transportation of prepacked retail cuts was brought out by Agricultural Marketing Service researchers. In testing the use of refrigerating meat trucks with liquid nitrogen, they found that it brought the temperature down but the surface of the meat turned dark. However, when the meat was removed from the nitrogen atmosphere, it regained its original bloom and was apparently just as fresh as when loaded on the trucks.

This raises all sorts of questions. Could a nitrogen atmosphere be used during transport to lengthen shelf life of meat? Could this principle be applied to the central pre-packaging idea? Further studies are being conducted at present to determine whether shelf life of meat can be prolonged by use of nitrogen refrigerant.

While a major break-through such as the use of nitrogen refrigerant may not be applicable for a few years, added shelf life can be obtained by the optimum use of sanitation, temperature, production planning, and control systems. Preliminary research shows that costs on central packaging of fresh meat can be reduced materially by better utilization of labor, and by the use of more efficient machinery equipment, and layout of processing lines.

Processing retail cuts of fresh meat in a central plant for a group of retail stores can save thousands of dollars annually in construction and labor costs - - - as much, for example, as \$650,000 for a group of 40 stores with a yearly meat volume of \$13,000,000. Benefits from such reductions in marketing costs are likely to be shared by consumers through lower prices at retail and by producers through higher prices for livestock.

Central processing of fresh meats has been attempted in this country by a number of firms, but, except for a few cases, has not been successful. The primary difficulties encountered appeared to be over-ordering, due to poor production planning and control, and lack of shelf life, due to improper sanitation and temperature control. As more knowledge is gained in this area especially in the length of shelf life, central packaging of fresh meats will surely expand.

### Air Transportation of High Value Lamb Cuts

Because of the unique market structure of lamb compared to other red meat products, it provides the basis for new approaches to how it may be marketed in the future.

Demand for lamb has not kept up with beef but has been trending slightly downward in per capita consumption over the past few years. Most of the lamb consumed in the United States is concentrated in a few metropolitan areas in the Eastern Seaboard Area and in the two major California cities of Los Angeles and San Francisco.

Production and slaughter is concentrated primarily in the Plains States and a few of the Mountain States. Therefore, distribution is a major problem.

By investigating the possibility of centralized processing of fresh meat, there appears to be possibilities of this process becoming prevalent in several areas of the United States. The physical characteristics of lamb require relatively short handling periods after packaging. Add the unique production and marketing areas, and lamb appears to be a product that could benefit from air shipment.

Studies have indicated that increases in a product have been greater in areas where consumers are already acquainted with the product than in areas that have not been exposed to the product or have a low consumption rate.

To derive the greatest benefit from a proposed plan such as air transportation of a product like meat, weight of course is the important factor. Reducing or eliminating all unnecessary weight becomes of prime importance. In considering what to ship by air requires the appraisal of the lamb carcass. Four wholesale cuts of lamb, the loin, leg, shoulder, and rack make up over 80% of the retail value of a lamb carcass. These cuts can be further reduced in weight by boning and trimming. To reduce further handling, the cuts can be packaged at the same time.

By performing these functions at the slaughtering site, a reduction in times handled and total weight would result. After completing the cutting, boning, and packaging services at the first processing point, the retail cuts would be ready for display in the retailers meat cooler.

With the use of modern cargo jets, costs of air transportation have been reduced. Also the use of better and faster ground-handling facilities are making air freight more competitive with conventional surface transportation methods. In the selection of a method of transportation, not only the total transportation cost should be considered but for meat products faster handling can reduce refrigeration time, spoilage, and pilferage.

An example might be helpful in showing the comparison of transportation costs by refrigerated rail car and air freight.

Table 2 Comparison of Costs of Rail Freight and Air Freight

	Rail Freight (dollars)	Air Freight (dollars)
Carcass wholesale cost per cwt., Sioux Falls, South Dakota	\$ 38.00	\$ 38.00
Rail refrigerated car transportation per cwt.	1.91	
Handling by refrigerated car	.94	
Air transportation at \$3.75 per cwt. 52 lbs. actual weight derived from 100 lbs. carcass		1.95
Handling -- loading and unloading and delivery to retailer. \$1.25 per cwt.		.65
Rail transportation for trimmings and low value cuts, 22 lbs. actual weight @ \$1.91 per cwt.		.42
Handling -- loading and unloading 22 lbs. @ \$1.00 per cwt.		<u>.22</u>
Total cost at Eastern Seaboard market less breaking, boning, and packaging	\$ 40.85	\$ 41.24

While there are several problem areas that would still require some research, air transportation could solve the bottleneck of distributing meat in a short time. While air transportation is not likely to provide a vehicle for a large volume of the meat handled, it could be important in the lamb trade. One plant adopting this method could process and air-transport the high value cuts from approximately 775,000 lambs annually based on one flight per day, 5 days each week.

Reduced handling costs and lower labor rates performed by Midwest packing plant workers would provide additional economies under the proposed plan. Also by providing a product easy to handle with little retail handling required, an increase in demand possibly could be stimulated. By offering boneless retail cuts in handy easy-to-display packages, retailers would be much more likely to increase the promotion and sale of lamb.

## OUR CHANGING COMPETITIVE POSITION

Rex D. Helfinstine\*

Today we are concerned with how South Dakota livestock producers may improve their competitive position relative to producers in other states. Implicit in this concern is the assumption that improvement in competitive position will arise from lower costs or higher prices of product compared to that for producers in other states. The resulting higher profits could be expected to encourage expansion of production in South Dakota. Aspects of this problem that will be discussed include:

1. Present competitive position of South Dakota livestock producers;
2. Fundamental changes taking place in the U.S. cattle, hog and sheep industries;
3. Implications of these changes for South Dakota producers;
4. Adaptation to these changes that will improve our competitive position;
5. Our strong and weak points in producing livestock and what we can do about them.

As background for proper perspective of the importance of beef cattle, hogs, and sheep, Table 1 presents the average number on hand in South Dakota and the U.S. for two different periods, 1955-59 and 1960-64:

Table 1. Total Number of Livestock Reported January 1 for the United States and South Dakota, 1955-59 and 1960-64.

	United States		South Dakota	
	1955-59	1960-64	1955-59	1960-64
	thousands		thousands	
Beef cattle, Jan. 1	60,868	71,596	2,765	3,176
Cattle on feed, Jan. 1	6,069	8,107	239	303
Hogs, Jan. 1	53,457	57,284	1,400	1,428
All sheep, Jan. 1	31,443	31,083	1,474	1,728
Sheep & lambs on feed, Jan. 1	4,313	4,133	235	256

Source: South Dakota Crop and Livestock Reporting Service and U.S. Department of Agriculture, Agricultural Statistics.

\*Professor of Economics, South Dakota State University.

Converting these figures into percent attributable to South Dakota will show more clearly the changes which have occurred in the competitive position of the state (Table 2).

Table 2. Average South Dakota's Contribution to the Total Number of Livestock for 1955-59 and 1960-64.

	1955-59	1960-64
South Dakota numbers as percent of U.S.		
Beef cattle, Jan. 1	4.5	4.4
Cattle on feed, Jan. 1	3.9	3.7
Hogs, Jan. 1	2.6	2.5
All sheep, Jan. 1	4.7	5.6
Sheep & lambs on feed, Jan. 1	5.4	6.2

Source: South Dakota Crop and Livestock Reporting Service and U.S. Department of Agriculture, Agricultural Statistics.

These figures demonstrate that we are not quite holding our own in number of beef cattle and hogs relative to the U.S. Sheep numbers in the U.S. have declined, so that the increase in numbers in South Dakota has meant sheep production has become relatively more important in this state. However, sheep production is not a major income producer in either South Dakota or the U.S., with only 3.4% of cash farm income in South Dakota coming from sheep in 1962. Table 3 shows the sources of average cash farm income in South Dakota.

Table 3. Average Gross Cash Income to South Dakota Producers for 1955-59 and 1960-62<sup>a</sup>

	1955-59 Average		1960-62 Average <sup>a</sup>	
	thousands	percent	thousands	percent
Cattle and calves	\$234,334	39.5	\$276,120	40.4
Hogs	95,662	16.1	100,728	14.7
Sheep, lambs, wool	19,934	3.4	23,936	3.5
Other livestock & products	69,388	11.7	75,413	11.0
Total livestock	419,318	70.7	476,197	69.6
Total crops	151,490	25.6	165,458	24.2
Government payments	21,696	3.7	42,145	6.2
Grand total	\$592,504		\$683,800	

<sup>a</sup> Income data for 1963 and 1964 were not available at the time this manuscript was prepared.

This table shows the much greater importance of beef cattle as a source of cash farm income. During the 1960-62 period, approximately 40% of cash farm income comes from cattle, compared with 15% from hogs and 24% from crops.



In order to improve our competitive position in livestock production we need to plan and carry out a program for doing so. Prior to planning such a program we need to consider four fundamental changes taking place in the U.S. livestock industry:

1. The increasing use of mechanization in livestock production.
2. Reasons why the average size enterprise has been increasing.
3. Factors which have led the retailer to be dominant in the market place.
4. The importance of various government programs in determining profits.

These changes will be discussed according to their implications for South Dakota producers in maintaining or improving our competitive position. All those familiar with the cattle-feeding, lamb-feeding or swine-raising industries realize how rapidly mechanization and automation have been adopted. Auger bunks, self-unloading wagons, automatic waterers, self feeders and confinement feeding have become commonplace. All reflect the increasing trend toward substitution of capital items for labor. Since labor costs have increased faster than mechanization costs for larger-size enterprises, substitution is generally profitable. Higher standards of living and desire for more leisure also may be factors contributing to this trend. Competition will require constant attention to all forms of unit cost-reducing alternatives.

Some adverse implications of this trend to mechanization are important. Perhaps the most important is the inability to recover investment costs in equipment in case the operator wants to quit. Used equipment generally will bring only a small fraction of original investment cost when placed on the market. Consequently, operators of automated set-ups have very little flexibility in scale of their enterprise or in changing enterprises. High fixed costs make it profitable for feeders to fill their lots regardless of cost so long as there is prospect of covering their cash operating expenses.

The historical cattle cycle, fluctuating with production and prices, may be passing; one geared to cycles of feedlot investment may take its place. Failures among higher-cost operators under such an environment may be frequent. This means it is very important for operators considering the mechanization of their set-ups to budget out likely costs and returns over the life of the investment. Accurate expected future costs and returns become crucial in making sound decisions. Likewise both the desire and ability of the operator to continue in business for the life of the equipment are important. Older operators need to be cautious in making heavy investments, unless they are certain their sons will carry on.

The increasing size of enterprise characteristic of cattle feeding, hog raising, and feeder cattle operations is closely associated with the trend toward mechanization. Economies in both production and marketing associated with size contribute to the trend. All this means that operators need to operate at a scale that will realize most of the economies of size, or that they have compensating advantages, if they expect to remain in business.

Most current studies of cattle feeding indicate production economies associated with size are largely realized with feed lot capacities in the 200 to 300 head size range. However, it is likely that larger sizes are required to realize all of the marketing economies. Research has not defined the size required to realize most of the marketing economies.

The third change taking place, involving the increasing dominance of the retailer in the market place, has been associated with the growth of large super markets and chain-store grocery merchandising. Many of these chains buy on a scale sufficient to dominate the market, usually by-passing the wholesaler, and sometimes the packer. An outgrowth of this trend has been the growth of grade and specification buying: chains require uniformity in their meat products; the products must meet what they consider to be the desires of consumers; and regular supplies must be assured. This need has been met by the chains contracting (perhaps through packing plants) with large-scale feedlot operators for regular supplies of a uniform quality of livestock.

The fourth change taking place, the increasing importance of government, involves feed grain programs, land retirement programs, recreation programs, and Indian-land leasing policies. All such programs influence the cost of inputs and become an important factor in profits. For example, feed grain programs have resulted in reduced acreage of feed grains, a large share of feed grain stocks being in government hands, and prices subject to manipulation by the government. Land retirement plans, recreation programs and Indian-land leasing policies, on the other hand, are more likely to affect the supply of grazing land, and thus, costs of raising feeder cattle. Most of these programs in the past have had a stabilizing influence on prices and costs. Implication of increasing government influence is that it becomes imperative for each operator to assess likely changes in government policy before undertaking large investments in livestock operations. Congressional actions must be carefully assayed before investing in any 10,000-head cattle feed lot!

#### Implications for South Dakota Producers

How can South Dakota livestock producers adjust to these changes so as to improve their competitive position? It is clear that producers who anticipate changes and are among the first to make adjustments will profit. Those adapting to change after everyone else will be losers, perhaps a casualty of competition.

Producers who expect to maintain or improve their competitive position under these changing conditions must learn and practice a well-known technique in farm or ranch management--budgeting. This is very simple, involving nothing more than comparing expected costs and returns from farming or ranching under alternative plans. Usually one compares expected costs and returns from the present organization with a new one.

In the case of any specific mechanization or automation technology, an operator needs to compare expected costs and returns with and without the equipment before he decides to use it. The best estimates available for depreciation, repairs, interest and other operating expenses and labor requirements, as well as future product prices and costs are required. Likely, this procedure will be required before any lender will make credit available to an operator.

The same procedure must be followed by the operator in budgeting out whether it will pay to increase the size of his enterprise. Perhaps the best advice for an operator of an enterprise of average efficiency is to increase the size of this enterprise as long as it offers potential profits and capital and credit are available. Such an operator may expand to obtain the production economies of size. Likely, the marketing economies of size may best be obtained by forming a cooperative with similar producers. The operators of businesses of above average efficiency need to make every effort to obtain capital and credit for expanding scale so as to obtain both economies of production and marketing. However, all operators need to realize that they may not maintain the same level of efficiency when they expand the size of their operations to the apparent optimum.

Adjustments to the increasing dominance of retailers involve two avenues. A large-scale individual producer can contract to advantage with them for specified grades and quantities over a period of time. Smaller-scale operators need to form some type of cooperative bargaining association and arrange among themselves to produce specified grades and quantities. Operators need to realize that it is no longer profitable to produce just any grade and quantity of livestock they desire. They must consider what the consumer wants, as interpreted by the retailer.

Other considerations in planning a program for improving our competitive position in livestock production involve our strong and weak points. We need to develop the strong points and minimize the weak points. Strong points include:

1. The low cost of feed as compared to other states.
2. The feeders and managers in this state are as competent as those of any other state.
3. The proximity of the feeders to adequate supplies of high quality feeder cattle and lambs.

We can exploit our low cost feed supplies by using them to the greatest possible extent for fattening livestock. It is surely more profitable to ship finished beef out of the state than feed grain stocks.

Our competent feeders and managers need to become even more competent through a continuing education program. Particularly important in such a program is learning to be better managers through close control of costs, and

study of market outlook, and trends in production and consumption in other areas. This requires detailed records and budgeting of all aspects of each producer's business. Education also needs to be continued in the area of livestock feeding so that the utmost efficiency of gains can be realized. Exploiting our advantage in proximity to feeders requires that we feed out as many of these animals as our feed supplies will support.

Weak points that need minimizing are:

1. The fluctuating feed supplies due to changes in weather.
2. The average size operation is smaller than in some of the other states.
3. The producers are further from the consuming centers than Iowa, Illinois, etc.

We can overcome the effects of fluctuating feed supplies by using a storage program for grain and hay and by developing our irrigation potential. Perhaps our greatest opportunity lies in making use of our underground water supplies for pump irrigation and of Missouri River storage supplies.

Perhaps the smaller scale of many of our operators may be compensated for through development of cooperative marketing agencies. Operators of feed lots and other facilities of a size below the optimum for production economies need to be encouraged to expand their operations.

The distance from consuming centers must be recognized as one weak point that individuals can do little to overcome. Transportation rates, however, are not necessarily set on an economic basis, but rather on a political basis. Action in this area could be helpful.

Finally, it should be recognized that any success we may have in expanding livestock production in this state should in itself improve our efficiency in both production and marketing. Such should follow from the economies the expansion would develop in feed mixing and handling and processing of livestock.

The future of cow-calf operations, year-around-farrowing of hogs, and farmer-feeding of cattle seems to be assured in South Dakota by the rising consumption of meat and exploitation of our natural advantages.

## MONEY MANAGEMENT-KEY TO SUCCESS

Kenneth R. Krause\*

If any age that man has passed through can be called an age of enlightenment in the use of capital, the present age in American agriculture is at the forefront. In this age we have seen American agriculture provide the highest standard of nutrition for our people of any age in recorded history while at the same time freeing men's backs from physical toil. The modern farmer and agri-business firm manager who uses credit wisely is not a slave to it--he is its master. He uses it to accomplish given ends and goals--that of producing, processing, and distributing food and fiber for his fellow man and for leisure and satisfaction in his own life.

Through a combined effort with processors and distributors, the farmer has increased his production from where one man produced enough to feed 13.5 people in 1940 to 30.7 people last year--an increase of over 2 1/4 times. In short, the modern agriculturist has used and will continue to use, new knowledge developed through research to provide our high and continually rising standard of living. A part of this better America is the result of wise management in the use of increasing amounts of capital in agriculture.

Trends in Farm and Ranch Capital Use<sup>1</sup>

The trend in agricultural production during the post war period has been a substitution of capital for labor and to some extent land, greater efficiency per farm firm, larger farm firms, and greater output per farm.

Since 1940 there has been considerable change in the type and magnitude of capital used by farmers. Farm real estate values have increased by 427%, livestock by about 337%, and machinery and motor vehicles by 623%. In 1963 the production assets used in agriculture were valued at over \$216 billion (Figure 1). Since 1950, the value of real estate assets has increased more rapidly than nonreal estate assets. The equity position of farmers has changed from 81% in 1940 to 91% in 1950 and decreased to 86% in 1963. While it has declined since 1950, it is still high by nonfarm industry standards.

On a per farm worker basis, the increase has been greater than the percentage increase for total agriculture in the 1940 to 1960 period. This is due in part to the substitution of capital for labor in the production process (Figure 2).

---

\* Assistant Professor of Economics, South Dakota State University

<sup>1</sup> Appendix 1 contains the data series which is referred to in this section.

FIGURE 1: PRODUCTION ASSETS USED IN U. S. AGRICULTURE, 1940 and 1963

		(Billions of Dollars)	Percent Increase 1940 to 1963
Livestock	1940	5.1	
	1963	17.2	337
Machinery and Motor Vehicles	1940	3.1	
	1963	19.3	623
Other	1940	2.3	
	1963	6.7	291
Farm Real Estate	1940	33.6	
	1963	143.6	427
Total	1940	52.9	
	1963	216.5	409

FIGURE 2: VALUE OF PRODUCTION ASSETS PER FARM WORKER U.S. AGRICULTURE

		(Dollars)	Percent Increase 1940 to 1963
Livestock	1940	\$450	
	1963	\$2568	571
Machinery and Motor Vehicles	1940	\$220	
	1963	\$2453	1115
Other	1940	\$282	
	1963	\$993	352
Farm Real Estate	1940	\$2461	
	1963	\$19,376	787
Total	1940	\$3413	
	1963	\$25,390	744



Capital investment on hog-beef fattening farms and Northern Plains cattle ranches has increased on the average in about the same magnitude as the national aggregate average. Between 1940 and 1963 total hog-beef fattening farm capital increased by 473%, while on the ranches it increased by 412%. Operating expenses increased by 1,025% on the farms; on the ranches it increased by only 348%. The relatively greater increase on the farms is due to the greater use of purchased inputs (Figures 3 & 4).

Major changes in the level and combination of farm inputs have occurred since 1940. Farm inputs such as fertilizers and machinery have become relatively more important in the farm production process. Farm real estate comprised 64% of the current dollar volume of all farm assets in 1940 and 66% in 1963. The stability of the real estate share has been due in a large part to the inflation of land prices.

While there have been major increases in the use of capital in farming, returns to labor and capital have not been high. The per hour returns for operator and family labor on Corn Belt hog and beef fattening farms has ranged from a high of \$2.12 in 1950 to a minus \$.54 in 1963. The returns to investment have been relatively low, from 2.72% in the 1961-1963 period to a high of 5.98% in the 1951-1955 period.

### Farm Labor Projections

Projections in farm labor use from 1960 to 1980 indicate that hired labor will decline by at least 30 to 35% and family labor by between 45 and 55%. (6) The projections for the total farm labor force indicate a decline of 44 to 49% or from 7.1 million in 1960 to 4 million in 1980.<sup>2</sup> If these projections are fulfilled, over 3.1 million potential farm workers will need to find nonfarm jobs. The minimum projected decline in 1980 would result in a farm population of 9 million compared to 14,313,000 in 1962. (5)<sup>3</sup>

### Projected Number of Farms and Ranches

Projections by Heady and Tweeten indicates a considerable decline in the number of farms and ranches in this county. (7) They have estimated that as few as 800,000 farms, or about 20% of the existing number, could fulfill production needs in 1980. When they extend trends to 1980, however, they estimate that the current number of farms will be reduced approximately 50%.

<sup>2</sup> In making these projections, the assumption is made that the general economy will be able to absorb the projected out-migration from the farm population at an income level which is equal to or greater than the farm income level.

<sup>3</sup> The number in parentheses refers to references cited located at the end of this paper.

FIGURE 3: CAPITAL REQUIREMENTS PER FARM -HOG-BEEF FATTENING FARMS, (CORN BELT)


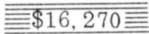





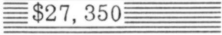
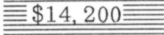
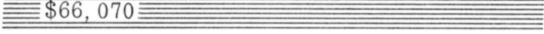
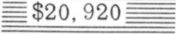


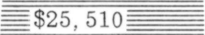








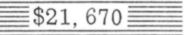

	(Dollars)	Percent Increase 1940 to 1963
Livestock	1940  \$2730	
	1963  \$16,270	596
Machinery and Equipment	1940  \$1890	
	1963  \$8,380	443
Crops	1940  \$1800	
	1963  \$8,200	456
Operating Expenses	1940  \$2,667	
	1963  \$27,350	1025
Real Estate	1940  \$14,200	
	1963  \$66,070	465
Total farm Capital	1940  \$20,920	
	1963  \$98,920	473

FIGURE 4: CAPITAL REQUIREMENTS PER RANCH (NORTHERN PLAINS LIVESTOCK AREA)

	(Dollars)	Percent Increase 1940 to 1963
Livestock	1940  \$6,830	
	1963  \$25,510	373
Machinery and Equipment	1940  \$1,820	
	1963  \$7,730	425
Crops	1940  \$1,030	
	1963  \$3,190	310
Operating Expenses	1940  \$2,146	
	1963  \$7,477	348
Real Estate	1940  \$11,990	
	1963  \$52,830	441
Total Ranch Capital	1940  \$21,670	
	1963  \$89,260	412

### Projected Capital Requirements

Appendix Table 7 shows actual and projected capital use of hog-beef fattening farms in the Corn Belt and cattle ranches in the Intermountain Region to 1980. For the hog-beef farms, total capital will likely exceed \$150,000 and over \$100,000 per man year. On the cattle ranches, average total capital will likely exceed \$125,000 and capital per man year will be over \$75,000. For the farms, the total capital requirements are estimated to be 160% of the current amount and for the cattle ranches 135% of the current amount. These projections represent a minimum size in terms of capital use that a farmer and rancher in these areas will need to achieve a minimum acceptable annual labor return to the farm or ranch family.

With these projected changes, it is suggested that instant "bigness" is not necessarily the answer for the individual farmer or rancher who plans to continue operations. A task that lies ahead is to transfer capital and credit from inefficient, low level management operations to larger, more efficient and well managed operations. This implies that considerable adjustment lies ahead in the organization and operation of farms that survive and grow. (4)

### Use of Capital and Credit to Improve Returns

There are several alternatives available to the individual farm or ranch operator to improve the returns from his operation. The most important is to strive for maximum operational efficiency. This will require the use of resources in enterprises that yield the highest returns and phasing out enterprises and activities from which the returns are lower. In general, the returns from operating items such as fertilizer, improved seeds, farm chemicals, and improved breeding stock are higher than from investments in land.

Many farmers can increase returns from the use of greater amounts of credit. It appears that farmers in the future will use considerably more credit and will need to plan to "live" with a high percentage of indebtedness. To obtain maximum size loans and returns from the use of credit, it will be necessary to develop a long term farm plan. To accomplish this the farmer should start with his current resource situation and project his operation to where he wants it to be in 5 or 10 years and how he expects to reach his objectives. The projection should include the amounts and types of credit needed, the timing of credit needs and the credit repayment schedule.

Farmers and lenders should consider a "farm management" loan for short and intermediate credit needs. (9) The objectives of this type of loan is to raise the level of income of the farmer. This type of loan places emphasis on potential increase in returns in addition to considering the farmers equity position. For example, a farmer may feel he can borrow only \$5,000 due to his equity position. After careful study with a lender, a mutual agreement may be reached that a \$10,000 loan is needed to increase the farmer's income and that the lender will be able to collect the principal plus interest.

A situation that appears to be developing is that the small inefficient farmer will have difficulty in securing a farm management type of loan. That is, the farm management loan or income improvement loan often does not appeal to a lender in the case of the small inefficient operator since the resource base is too small to start with. In making farm management type loans, lenders face a "real" challenge in evaluating a farmer's management practices and potential and in projecting farm product output and prices. Lenders that will adequately service farm management loans will need to keep on file long term income and expense statements and net worth statements of the farmers they work with. In addition budgeted income and repayment statements will be required to help improve upon the changing seasonal credit needs of farmers.

A farmer should borrow for those activities for which the returns will be the greatest. In terms of timing, a machinery loan in the fall may curtail a loan to expand a dairy enterprise in the spring, while if the dairy loan had been completed first--the probability of receiving the machinery loan in the spring may still be high. (1)

When shopping for credit, three major factors should be taken into account: (1) interest rate, (2) repayment schedule, and (3) service provided with the loan. In most cases, it is wise to work with one source of credit--if the source can provide all of the farmer's needs. This arrangement should allow the credit source the opportunity to become acquainted with the farmer's operation, ability, and needs. When multiple sources are used, equity or security are the prime consideration for granting a loan and it appears that the farmer stands less chance to receive the farm management type of loan.

It is observed however, that the use of merchant and dealer credit is continuing to play an important role in financing short term farmer credit needs. This may be due, in part, to the fact that the merchant or dealer is able to make additional sales through the extension of credit or to receive the "asking price" if he grants liberal credit terms. In addition, the dealer may be able to arrive at terms that allow him a margin to assume some risk unacceptable to commercial lenders. A dealer should be better equipped to judge the "pay-off" from new equipment. Thus a dealer can probably afford, if necessary, to finance more liberally than can a primary lender with fixed-dollar interest returns. When a farmer uses merchant and dealer credit along with traditional sources he is faced with increased financial management responsibilities and may not be able to obtain maximum credit since neither source may then be in a position to use the farm management type of loan.

For some farmers with an "adequate" equity position, nonfarm investments may yield a higher return than farm investments. Some farmers have invested in common stocks, government bonds, nonfarm real estate, etc.

While farm children are not commonly thought of as a part of the farm business, in a manner similar to the livestock or crop enterprises, in reality they are more important. An emerging concept in terms of farm family financing is to give children education to the limit of their ability. The idea-- the finest thing a farmer could leave his children is a mortgage free farm-- is changing to the finest thing he can give them is a first rate education to the extent of their ability.

A second area where the returns are high is education of the farmer himself. It is suggested that farmers should budget a portion of their farm expenditures for self education. This includes subscriptions to farm magazines, new text books, and attendance at various farmer educational schools and meetings.

### Alternatives for Securing Added Farm Capital Needs

No business can continue to grow without adding capital, whether it be from earnings or added from other sources. Projections indicate that farmers will use more capital in the future. There are a number of ways that a farmer and rancher can secure added capital that will be needed.

Among capital resources valuable to a farmer is his credit supply or his ability to borrow. Although it is not listed in a conventional balance sheet as an asset, credit provides a reserve that can be drawn upon much like cash. When it is unused it provides some liquidity that enables a farmer to undertake ventures unacceptable to an indebted individual. The credit reserve is subject to growth or decline through financial as well as production decisions. Use of farm resources that increase income generally increases credit availability. Credit can also be increased by increasing asset liquidity and by using credit for loans relatively favored by lenders. Lenders generally prefer loans used for tangible assets (machinery instead of labor) and self-liquidating purposes. Feeder cattle and feeder pig loans, meeting both criteria, are favored and can lead to a larger credit reserve than do many other types of loans.

Financial reserves can be gained through use of formal insurance since it is, in one respect, the hire of a contingency reserve. In this light the returns from insurance equals the size of this reserve (the amount of the indemnity) multiplied by the rate earned by investing or otherwise using the reserve fund. Farmers appear to slight the consideration of formal insurance alternatives for more obvious physical production problems such as choice of tractors, other machines, and livestock. However, the management returns from formal insurance selection can be rewarding.

An additional way that farmers can gain control of needed capital is through present ownership of assets that may appreciate in value through time. Land is a prime example and may be competitive in returns with non-real estate investments if land prices continue to increase.

For the individual farmer who owns or will consider purchase of land, several factors appear likely to influence land prices and should be considered. Factors favoring a rise in land values are continued inflation, increased productivity from land, continued pressure for marginal expansion of existing units, urban and industrial expansion, and nonfarm recreational uses. Forces that may exert a downward pressure on land values include a possible increase in long term interest rates thus increasing the cost of credit, rising real estate taxes, and lower farm earnings. (3)

A second important method is through savings. The key idea is to forgo present consumption for future use or expectations. In the aggregate, inheritance is an important source of farm firm capital. Inheritance tax, titles, transfer, and family estate goals appear to merit considerably more attention in farm financial planning than they have received. Income, inheritance, and estate tax savings can be major if properly planned. In addition, estate planning includes investments and a family savings program.

Joint ownership or partnership in farm assets also offers promise as a continuing method by which farmers can gain control of necessary assets. Joint ownership or partnership of land, machinery, and equipment are the major areas that can be expanded. Incorporating the farm or ranch business also offers potential for increasing available capital and credit in some circumstances. While the corporation farm has the feature of limited liability to individual shareholders, total capital may be increased through family members investing inherited capital stock and family or nonfamily private funds which in turn may create a larger capital and operating base on which to borrow additional funds.

The entire field of leasing and contract purchase of inputs used in farming is increasing. Sale of farms and ranches by contract increased from 10% in 1953 to nearly 50% in 1963 in South Dakota. (2) Contract feeding of cattle appears to be increasing. Leasing of farm land has long been used and appears to continue to be an important source of capital to the operating farmer. In recent years, considerable interest has been generated in leasing various capital items such as farm machinery and equipment, certain types of materials handling, and storage facilities and to some extent livestock. The terms, to date, on personal property are not as favorable to the farm operator as is the leasing of farm land and buildings.

For some farmers, with ownership of farm real estate, perpetual debt or equity financing may help to increase the capital supply. The central idea with this arrangement is for a farmer who owns real estate to assume a certain level of permanent debt against real estate. If the loan level is not too high and the farmer can make productive use of a permanent loan, he stands to gain financially. A lender can also look favorably upon this type of loan because of the minimum service expenses and risks involved.



Integration offers an opportunity for a farmer to work with greater amounts of capital. With integration, a nonfarm firm becomes an entrepreneurial participant in a specific farm enterprise. The integrator often furnishes all or part of the capital requirements. He may also guarantee some market conditions. Use of an integrated, or contract for production, arrangement centers around the fact that most of the labor and the fixed capital needed for production (real estate, buildings and farm equipment) are supplied by the farmer. In contrast to complete ownership of facilities, contracts generally permit greater flexibility to the integrator in a developing industry confronted by uncertainties. This is the case since he requires the farmer to carry the risk of investment in specialized buildings and equipment and to provide the labor. (8)

In general, production through contract rather than by owner integration is fostered by the existence of underemployed labor and other resources that yield low alternative returns and that are available for use at a relatively low opportunity cost. In general, the farmer gives up some freedom of decision making and the opportunity for large gains when he enters into a contractual production arrangement. However, the farmer's returns may be increased if he lacks adequate capital and managerial ability.

### Alternative Financial Institutions

The goal that farmers seek in their credit institutions is that of a stable and dependable source of loans for legitimate needs. This should be at terms consistent with the risks involved and the costs associated with alternative returns on money, and "wholesale" money market discount rates.

Agricultural credit institutions face a number of problems with the changing nature of farming. For instance, they have fewer farmers to serve. The remaining farmers are requiring larger and, in some cases, new types of loans and more service with the loans. With larger loans they may be able to provide more service per loan since they have a larger absolute margin per loan. In general, institutions prefer to work with larger loans which often means a "going and growing" farm firm.

There are some major differences in the credit needs of the clients that some institutions serve. The typical farm firm or farm feedlot is small in comparison with firms often found in other industries, and farm loans in some cases involve greater risk. One result is that farm firms have not had access to capital through the sale of shares of stock, bonds, and other securities and whose credit standing makes loans relatively obtainable from banks and other sources. Each farm firm is an individual case and loans require personal contact between a farmer or feeder and the lender.

With the projected increase in capital needs it appears that farmers will use more credit in the future. Hence farmers have an interest in a thorough acquaintance with financial institutions and the supply of money and with the ability of the institution to meet their future needs.



There are multiple farmer credit sources. Each major type has its own particular advantages and limitations and policies. Five major sources provide the basic supply of money for farmers. The institutions are described in terms of their current practices. In some cases changes will likely need to be made in the institutions as change in farmers' credit needs evolve.

### Individuals

Personal savings and direct loans from individuals provide one source. Individuals have been the major source of farm mortgage loans. A farmer who retires or leaves farming may place his farm on the market. Purchasers often do not have adequate available funds for full payment. In addition to borrowing from public institutions, the purchaser is often aided by the seller who may be willing to accept part payment, and accept a mortgage for the balance. Local, city residents with surplus funds also find farm mortgage investments acceptable since they are often acquainted with the farm and the borrower. In the future, farmer-owned partnerships and corporations will likely be more important in providing farm capital.

### Commercial Banks

State and National banks obtain funds through sale of capital stock, by time and demand deposits, and through discounts from the Federal Reserve Banks. The Federal Reserve Board has the power to set the reserve requirements for member banks and in this way can increase or decrease the supply of money available for bank loan purposes.

Banks are custodians of funds of their depositors and create deposits through lending operations. Their primary responsibility is to keep sufficiently liquid to meet current needs of depositors. Hence, most of their loans are for relatively short periods. However, they are increasing the number of intermediate term loans to farmers. Real estate loans are best suited for funds other than those originating with bank demand deposits.

Larger loans requested by farmers create a problem for the smaller banks because many of them cannot make loans large enough to meet the needs. Federal regulations limit national bank loans to one individual to 10% of the bank's capital and surplus. South Dakota law allows state banks to loan 20% of capital stock and surplus to one individual. In view of the fact that many rural banks have small capital accounts, it is evident that they are limited in size of loan that they can make from their own resources.

Some rural banks, with limited lending capacity, have made arrangements with correspondent banks in large towns or cities for participation in their larger loans. Some also have arrangements with individuals who will lend on large loans. Rural banks have been relatively isolated from changes in

credit conditions in the larger financial centers. If they become involved to a greater extent in the use of city correspondent banks, funds available to the farm borrower may be more directly affected by change in industrial conditions. The farmer will also have to compete to a greater extent in the future with consumer financing that rural banks may engage in.

Banks which are in a position to enlarge their capital and surplus resources can increase the size of the individual loan they can make by doing so. Also, absolute lending limits can be increased by increasing bank deposits and especially time deposits since the reserve requirements are usually lower on these. Another alternative open to banks is to expand to area branch banks. In some instances, rural banks in an area have an arrangement for sharing in large loans. Under the inter-bank compacts a single bank is responsible entirely for any given loan but is able to add to its reserves some fraction of the combined reserves of all banks in a given compact. If this idea should develop, banks might be grouped along geographical lines and similarity of interest and environment and outlook of bankers. Together, such a group of banks might eventually gain additional benefits--perhaps some specialization in lending and in joint hiring of personnel.

More country banks and their metropolitan correspondents are finding it advantageous to hire personnel with technical training in agriculture and who are experienced in dealing with farmers and feeders. The main purpose of the agricultural representative is not to advise farmers or feeders on how to run their businesses but to improve lending and other services of the bank to the rural borrower.

### The Farm Credit Administration

The special need of agricultural finance lead to governmental development of several specific types of lending agencies. The Farm Credit Administration was created in 1933 to bring the supervision of the Federal Land Banks, Federal Intermediate Credit Banks, and the Bank for Cooperatives under one unit. Each of the institutions administered under the Farm Credit Administration is essentially farmer cooperative type credit institutions. These banks sell bonds for members on the central money markets to the investing public. The money supply for farmers needs can be expanded in this way as long as the central markets are able to provide it.

### Federal Land Bank System

Local Federal Land Bank Associations are owned and operated by farmers and serve as the contract between farmers and the Federal Land Bank of the district. The Federal Land Bank system, while under governmental supervision, functions with private capital. The present capital of the Land Banks and of the Associations is made up of member owned stock and reserves and surplus. The voting power is in the hands of the borrowers. Loan funds are

obtained mainly through the sale of land bank bonds on the open market backed by first mortgages on the farms on which loans are made. The system serves as a connecting link between the farmers who borrow from it and the investors who provide the loan funds. Federal Land Bank bonds can be described as standardized units of the mortgages. The banks and local associations appraise the farms and supervise and administer the loans. The investor buys the bonds on the basis of his trust in the system without having to concern himself with the individual borrowers of funds. The bonds are not federal government obligations in the sense that the repayment is guaranteed by the government. However, the general assumption appears to be that public funds likely will be available to bolster the system if the need should arise.

### Federal Immediate Credit Banks

The Federal Immediate Credit Banks are designed to serve as a discount agency with which commercial banks, financial corporations, livestock loan companies, Production Credit Associations and other institutional lenders can discount agricultural paper. This arrangement enables them to make loans to farmers for periods of about 6 months up to 3 years.

### Production Credit Association

The major source of funds for the Production Credit Association is private capital obtained through the Intermediate Credit Banks by their sale of debentures bonds backed by farm paper. Loans to farmers and feeders are for short and intermediate agricultural purposes. Each Production Credit Association is an individual cooperative chartered under the Farm Credit Act. Most Production Credit Associations draw their business from a larger area than is usually served by country banks.

Loans are mainly for production purposes and the average size loan is larger than that of most banks. Production Credit Associations are in a position to provide relatively continuous sources of operating credit, especially when banks are unable to provide farmers with credit needs. PCA's do not receive deposits and thus do not need to be as liquid as commercial banks, and hence may be somewhat freer in making intermediate term loans. Since PCA's are limited to lending to farmers, they can concentrate on agricultural needs and uses to a greater extent than is possible for country banks which perform a variety of services. In some localities, banks are the pace setters in serving the short and intermediate term credit needs of agriculture. In others, Production Credit Associations may be the leader with the quality and ability of management being the decisive factors.

### Bank for Cooperatives

Farmer cooperatives are looked to as a means of improving upon the returns to farmers for product sale and for reduction in the cost of inputs. Financing may be a weak point in many farmers cooperatives because of

limited farmer funds and their reluctance to draw upon them for financing their cooperatives. Returns on capital invested by a cooperative are typically limited to the going rate of interest since gains are distributed on the basis of patronage. This may tend to reduce the willingness of members to assume the risks involved in the cooperative business enterprise since returns to funds invested in their own farm businesses may be higher than the going rate of interest paid by their cooperatives.

The Banks for Cooperatives are authorized to make commodity, operating, and facility loans to farmer cooperatives in their districts. The central Bank for Cooperatives may participate in loans which are too large for a district bank to handle by itself and it may make direct loans in the cases of some national cooperatives. The loan funds are obtained from the sale of consolidated collateral trust debentures to investors and by borrowing from Intermediate Credit Banks, Land Banks, other banks for cooperatives, and commercial banks.

### Farmers Home Administration

The Fourth source, the Farmers Home Administration is a governmental lending agency operated within the United States Department of Agriculture. Funds for this institution come from three main sources--(a) a specific amount which Congress authorizes the agency to borrow from the Treasury each year, (b) a revolving fund set up by Congress which provides essentially for emergency loans and, (c) funds furnished by banks and other lenders for loans insured and serviced by the FHA.

Its function is to make loans to selected farmers who lack commercial credit and to make emergency loans in disaster areas, that is, areas which have been so designated because of extreme weather conditions. Recently it has become involved in lending for rural area development purposes. It makes both short and long term loans. The former are for operating purposes and for meeting emergency situations. The latter may be made for periods up to 40 years to help borrowers acquire, enlarge, or develop farms. The Housing Act authorized the Farmers Home Administration to make loans for erecting or improving farm residence and buildings. An important aspect of its operation is the supervision it provides over the farm operation of its patron. This guidance is designed to improve the economic status of the borrower and to increase the prospects of repayment. When borrowers advance to the stage where commercial credit is available to them they are expected to refinance their Farmers Home Administration loan.

### Insurance Companies

Insurance companies receive their funds from premium income and from investment income from asset investment. They finance rural and urban mortgage because loans of this type are among the investments suited for their funds. Insurance companies adjust their investment in farm mortgages to their current investment policies and not to the needs of farmers. They have no

obligation to make farm loans. However, they have generally been very active in the farm field over time.

The volume of life insurance company farm mortgage loans is nearly double that of commercial banks. Mortgage departments of insurance companies and banks in many instances work closely together in farm real estate financing. A bank may have an arrangement with an insurance company whereby the latter stands ready to take over mortgage loans for the bank in accordance with a previous arrangement. This arrangement enables the bank to be more effective in farm real estate financing and to provide a more complete credit service to a community. The arrangement is advantageous to the insurance company since it provides a local contact for making and servicing mortgage loans. However, most major life insurance companies also employ farm loan representatives who lend on real estate directly to farmers for their company.

#### REFERENCES CITED

1. Baker, C.B. and J.M. Holcomb, "Emerging Financial Problems in American," Journal of Farm Economics, Vol. 46, No. 4, December 1964.
2. Berry, Russel, "Buying Farmland on Installment Contracts," Circular 164, Agricultural Experiment Station, South Dakota State University, August 1964.
3. Diesslin, Howard G., "Evaluation of the Credit Market and Credit Institutions," Capital and Credit Needs in a Changing Agriculture, Iowa State University Press 1961, pp. 215.
4. Doll, Raymond J., "Capitalization in Agriculture," Proceeding of Great Plain Agricultural Council, Santa Fe, New Mexico, July 1964.
5. Farm Population, Bureau-of-the Census Series ERS (p.27), March 1963.
6. Heady, Earl O. and Gordon Ball, "Economic Growth of the Farm Firm and Projected Changes in Farming," NC-4 CAED, FF., Iowa State University, October 1964.
7. Heady, Earl O. and Luther G. Tweeten, Resource Demand and Structure in the Agricultural Industry, Iowa State University Press, Ames 1963, pp. 480-481.
8. Jones, L.A. and Ronald Mighell, "Vertical Integration As a Source of Capital in Farming," Capital and Credit Needs in a Changing Agriculture, Iowa State University Press 1961, pp. 147.
9. Murray, William G. "Farm Credit Institutions," Capital and Credit Needs in a Changing Agriculture, Iowa State University Press, 1961, pp. 195.

## Appendix 1

## Past, Present and Future Capital Requirements

Table 1. Production Assets Used in Agriculture, United States, 1940-1963.  
(current prices)<sup>1</sup>

Year	Farm real estate <sup>2</sup>	Livestock	Machinery and motor vehicles <sup>3</sup>	Other <sup>4</sup>	Total	% of total represented by real estate	Proprietor equity
	Billion Dollars	Billion Dollars	Billion Dollars	Billion Dollars	Billion Dollars		Percent
1940	33.6	5.1	3.1	2.3	52.9	63.5	81
1950	75.3	12.9	11.3	6.7	131.6	51.3	91
1960	129.1	15.5	18.6	7.1	202.9	63.6	88
1961	130.6	15.5	18.1	6.6	204.1	63.9	88
1962	137.4	16.4	18.6	6.6	208.0	66.0	87
1963	143.6	17.2	19.3	6.7	216.5	66.3	86

<sup>1</sup> Source: Balance Sheet of Agriculture, 1961-1963, Ag. Information Bulletins 247 and 281 USDA.

<sup>2</sup> Excludes value of operators' dwellings

<sup>3</sup> Includes 40% of value of automobiles

<sup>4</sup> Includes one-half of January 1 inventory value of feed crops, hay and forage stored on farms (excluding CC loans), and working capital needed to meet farm production expenses.

Table 2. Value of Production Assets per Farm Worker, United States, 1940 to 1963 (current prices)<sup>1</sup>

CURRENT PRICES					
Year	Farm real estate	Livestock	Machinery and motor vehicles	Other	Total
1940	\$ 2,461	\$ 450	\$ 220	\$ 282	\$ 3,413
1945	4,462	881	548	734	6,625
1950	6,483	1,295	1,043	676	9,448
1955	9,921	1,268	1,631	857	13,677
1959	14,703	2,310	2,139	1,016	20,168
1960	15,797	2,071	2,243	968	21,079
1961	16,655	2,202	2,247	939	22,043
1962	17,843	2,265	2,313	957	23,478
1963	19,376	2,568	2,453	993	25,390

<sup>1</sup> Source: Balance Sheet of Agriculture, 1961-1963, Ag. Information Bulletin 247 and 281 USDA.

Table 3. Capital Investment per Farm, Hog-Beef Fattening Farms, Corn Belt<sup>1</sup>

Year	Real estate	Livestock	Machinery and equipment	Crops
1940	\$14,200	\$ 2,730	\$1,890	\$1,800
1950	33,560	8,810	5,400	6,470
1955	46,000	9,310	7,170	7,330
1960	56,590	13,050	7,790	6,630
1962	64,240	15,230	8,000	7,100
1963	66,070	16,270	8,380	8,200

Table 4. Capital Investment per Ranch--Cattle Ranches, Northern Plains Livestock Area<sup>1</sup>

Year	Real estate	Livestock	Machinery and equipment	Crops
1940	\$11,990	\$ 6,830	\$1,820	\$1,030
1950	32,480	17,140	5,920	3,990
1955	41,650	15,310	7,470	4,770
1960	49,720	21,270	8,080	3,610
1962	50,660	21,900	7,830	3,120
1963	52,830	25,510	7,730	3,190

<sup>1</sup> Source: Costs and Returns on Commercial Farms, Agricultural Information Bulletin No. 230, Revised June 1964 (USDA).



Table 5. Capital Requirements and Returns (per Hour, Operator, and Family Labor), Hog-beef, Fattening Farms, Corn Belt<sup>1</sup>

Year	Total farm capital	Gross farm income	Operating expenses	Net farm income	Returns per hour, operator and family labor
1940	\$20,090	\$ 4,517	\$ 2,667	\$ 1,850	\$ .29
1950	54,240	20,114	10,121	9,993	2.12
1955	69,810	16,535	12,574	3,961	.27
1960	84,060	23,667	17,810	5,857	.17
1962	94,570	33,702	23,517	10,183	1.22
1963	98,920	31,024	27,350	3,674	- .54

Return per \$100 invested<sup>2</sup>

1951-55	5.98
1956-60	4.51
1960-62	3.70
1961-63	2.72

<sup>2</sup> Calculated with family labor at wage rates paid for hired labor.Table 6. Capital Requirement and Returns (per Hour, Operator, and Family Labor) Cattle Ranches, Northern Plains Livestock Area<sup>1</sup>

Year	Total ranch capital	Gross ranch income	Operating expenses	Net ranch income	Returns per hour, operator and family labor
1940	\$21,670	\$ 3,602	\$2,146	\$1,456	\$ .08
1950	59,530	10,107	5,076	5,031	1.71
1955	69,200	8,808	5,946	2,863	.87
1960	82,680	11,712	6,049	4,980	.01
1962	83,510	14,099	6,847	7,252	1.18
1963	89,260	15,017	7,477	7,540	1.18

<sup>1</sup> Source: Costs and Returns on Commercial Farms, agricultural Information Bulletin No. 230, Revised June 1964 (USDA).

Table 7. Actual Capital Investment for 1930, 1950, and 1963 and Projected Capital to 1980 for Hog-Beef Fattening Farms and Cattle Ranches in the Intermountain Region<sup>1, 2</sup>

Item	Actual		Projected	
Hog-Beef Fattening Farms--Corn Belt	1930	1950	1963	1980 <sup>3</sup>
Land and buildings <sup>4</sup>	\$23,280	\$33,560	\$66,070	\$108,583
Other capital <sup>5</sup>	8,300	20,680	32,850	48,765
Total Capital	31,580	54,240	98,920	157,348
Capital per man year <sup>6</sup>	19,374	37,930	64,653	104,899
Capital per acre <sup>7</sup>	180	280	428	564
<u>Cattle Ranches Intermountain Region</u>				
Land and buildings <sup>4</sup>	15,510	26,550	39,780	57,081
Other capital <sup>5</sup>	17,900	43,530	55,770	71,776
Total Capital	33,410	70,080	95,550	128,857
Capital per man year <sup>6</sup>	18,876	45,804	55,877	75,788
Capital per acre <sup>7</sup>	27	42	54	68

<sup>1</sup> Source: Costs and Returns on Commercial Farms, USDA Agricultural Information Bulletin No. 230, Revised June 1964.

<sup>2</sup> Projections are taken from Baker, C.B. and Tweeten, L.G. "Financial Requirements of the Farm Firm" NCR-4 Preliminary Report, October 1964.

<sup>3</sup> Projections are linear extensions of the 1950-63 trends in capital use to 1980.

<sup>4</sup> Includes operator dwelling, service buildings, other improvements, and land.

<sup>5</sup> Includes machinery, equipment, livestock, and crops.

<sup>6</sup> A man year is total annual hours of operator, family, and hired labor divided by 3,000.

<sup>7</sup> Acres include all land in the farm and ranch; capital per man year and per acre includes all real estate and other capital.

## ACTIVITIES OF THE ECONOMICS DEPARTMENT

The aim of the Economics Department is to help both farm and city people to achieve higher levels of living. To this end, it has three main areas of effort - instruction, research and extension education.

The department teaches both general and agricultural economics. Nearly all students on the campus take a course in citizenship economics. A large proportion of the students are taught the principles of business law, business and farm management, and accounting. Each year an increasing number of students major in economics.

Most of the teachers also do some research. Much of this research is in the field of agricultural economics. However, some of it - such as in the areas of taxation and marketing - affects both farm and city people. Reports are published as bulletins, circulars, or pamphlets. A bi-weekly "Economics Newsletter" is issued free to a large mailing list through the Agricultural Extension Service.

The Extension Economists work closely with the research staff of the department. This makes it easier for them to extend the teaching function of the department and to carry to the people of the State the latest development of research and the application of economic analysis.

This publication is the result of a staff effort to bring research results and accumulated knowledge to bear on the problems of the livestock industry of the State for presentation at the Fourth Annual Agri-Business Day conducted by the Department in Rapid City on March 25, 1965, and in Brookings on April 1, 1965.

## SOME RECENT PUBLICATIONS OF THE ECONOMICS DEPARTMENT

### Bulletins

B	494	Economic and Organizational Aspects of Cooperative Feedlots	1961
B	497	Procurement Policies and Practices of Dairy Manufacturing Plants in Eastern South Dakota - Part I Market Structure and Behavior	1961
B	498	Procurement Policies and Practices of Dairy Manufacturing Plants in Eastern South Dakota - Part II Managerial Decision Making	1961
B	510	Farm Tenancy Problems in South Dakota	1963
B	518	Economic Comparison of Irrigated and Dryland Farming in Central South Dakota	1964
B	523	Ethical Studies Management Ethics Guide - Small Business Management Research Report	1964

### Circulars

C	142	Planning a Father-Son Partnership	1958
C	145	Some Considerations for a South Dakota State Income Tax	1959
C	150	Financing Cooperatives with Revolving Funds	1961
C	158	How to Use the New County Share Rent	1964
C	164	Buying Farmland on Installment Contracts	1964

### Pamphlets

P	114	Cost of Producing and Marketing Finished Beef in Relation to Consuming Areas	1963
P	115	Marketing and Other Factors Affecting the Cattle Feeding Enterprise in Eastern South Dakota	1963
P	116	Variability of Feed Grain Beef Cattle Systems in South Dakota	1963
P	118	An Appraisal of the Use of Soil Survey Information as the Basis for Valuing Land for Tax Purposes in Spink County, South Dakota	1964
P	119	Community and Commercial Benefits from Water Resource Development of the Oahe Area	1964
P	121	Increasing Income From South Dakota Resources	1964
P	122	South Dakota Agriculture and its Problems	1964
P	123	An Analysis of Economic Factors and Institutions Affecting the Productivity of South Dakota Land and Water Resources for Upland Game Birds and Migratory Waterfowl	1964

### Fact Sheets

FS	174	Group Bargaining Power in Agriculture	
FS	175	Buying Feeder Pigs? An Economic and Management Guide	
FS	188	Custom Rates Paid by South Dakota Farmers in 1962	
FS	206	Where the Consumers Beef Dollar Goes	
FS	209	Beef Marketing Costs and Margins	
FS	211	Oahe Area Water Resource Development for Community and Commerce	
FS	266	Contract Marketing of Poultry and Eggs	